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An Address

ON

THE IMPORTANCE OF BED-SIDE STUDY AND TEACHING*

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IT is my first duty and pleasure to bring greetings to the Hamilton Academy of Medicine from the Medical Staff of the Johns Hopkins University and Hospital, where the great physician whose name and activities we are commemorating today spent sixteen of the most active years of his life, from 1889 to 1905, as Professor of Medicine at the University and as Physician-in-Chief at the Hospital. As a fellow Canadian, and as a hospital assistant and associate of Sir William Osler during eleven of those sixteen years, I wish to personally express my appreciation of the decision of the Osler Memorial Committee of The Canadian Medical Association, of which his former assistant, Dr. Campbell P. Howard, of Montreal, is Chairman, to hold annual Osler Day exercises.

It seems most appropriate that these first exercises should be held here in Hamilton to commemorate the appearance of Sir William's first paper, "Christmas and the Microscope", which was published in *Hardwicke's Science-Gossip*: an Illustrated Medium of Interchange and Gossip for Students and Lovers of Nature, London, 1869, V, p. 44. In the first place, Sir William's parents moved from Bond Head, near Lake Simcoe, where he was born, to Dundas, six miles away, in 1857, when he was nine years of age. Secondly, in his late "teens" his interest in the microscope, which had been stimulated by Rev. W. A. Johnson, one of his masters at Trinity College School at Weston near Toronto, and by Johnson's friend, Prof. James Bovell, of Trinity University, had led him to make zoological studies of the waters of the Dundas marsh and of the Desjardin canal. These investigations led to the publication of his second paper entitled "Canadian Diatomaceæ", which appeared in the *Canadian Naturalist and Quarterly Journal of Science*, Montreal (1870-1871, N.S., V, p. 142-151). Finally, Sir William was always on intimate terms with the medical profession of your city, particularly with several of the older group now deceased, — Malloch, Mullin, MacDonald, O'Reilly and Osborne, and with Dr. Ingersoll Olmsted and Dr. J. Heurner Mullin among those still living.

As Sir William Osler, more than any other physician, was by example responsible for the encouragement of bed-side teaching in the hospitals of the United States, a system of clinical instruction now the custom the world over, I hope that I may be forgiven if some of my remarks are rather intimate and personal, for I was one of his hospital assistants at the Johns Hopkins Hospital during the period when he introduced this method of teaching clinical medicine to medical students.

The first edition of Osler's text-book on The Principles and Practice of Medicine came out in 1892, and was available for myself and class-

* Read as an after-luncheon address at the meeting of the Hamilton Academy of Medicine for the inauguration of the first annual Osler Day, on February 27, 1935.

mates at the beginning of my fourth year at Toronto University Medical School for the term 1892 to 1893. You can, I think, realize the thrill this wonderful work gave us medical students. It was based on his thorough knowledge of medical literature and on his wide clinical and pathological experiences at the Montreal General Hospital and the Philadelphia Hospital (Blockley) during his professional periods at McGill, the University of Pennsylvania, and his first three years at the Johns Hopkins University and Hospital. As you know his text-book was dedicated to his teachers, William Arthur Johnson, Priest of the Parish of Weston, Ontario, James Bovell, of the Toronto School of Medicine and of the University of Trinity College, Toronto, and to Robert Palmer Howard, Dean of the Medical Faculty and Professor of Medicine, McGill University, Montreal, to all of whom he felt he owed so much in his pre-medical and early medical years. Written by one with a wide knowledge of general literature and the humanities, the subject matter was often presented in a way that left an indelible impression on our memories. For example, in discussing the factors that might play a part in the causation of aortic insufficiency, he concluded the discussion as follows, "It is interesting to note with what frequency this form of valvular disease occurs in soldiers. I was struck with this fact in the Philadelphia Hospital, to which so many veterans of the civil war are admitted. I was in the habit of enforcing upon my students the etiological lesson by a mythological reference to Bacchus and Vulcan, at whose shrines a majority of the cases of aortic insufficiency have worshipped, and not a few at that of Venus." How could one forget the etiological factors, then believed to be the cause of this valvular lesion, when presented in such a dramatic way!

The intensive study of this stimulating text-book, I remember, roused the unconscious thought in my mind how wonderful it would be to have the opportunity to have post-graduate instruction under such an inspiring teacher. Having graduated in medicine in May, 1893, I had the good fortune to be appointed to a house-surgeonship at the old Toronto General Hospital for the year 1893-1894. In May, 1894, Dr. Walter B. Platt, Medical Director of the Garrett Children's Hospital and Sanitarium, Baltimore, asked Dr. Osler if he would try and find a young physician to take charge of the summer sanitarium situated at Mt. Airy, Md., forty-two miles from Baltimore at the foothills of the Blue Ridge Mountains, where children, chiefly with summer diarrhœas, were sent for treatment. Dr. Osler wrote my greatly esteemed teacher Dr. James E. Graham, then Professor of Medicine at Toronto University, asking if he could recommend a young graduate for the position and I had the good fortune to be selected. Having secured the permission of Dr. Charles O'Reilly, Superintendent of the Toronto General Hospital, to leave before my year's service was concluded, I left early in June to take up my appointment, and had the pleasure of meeting Dr. Osler in Baltimore on my way through, my first contact with him. I met him at his home, often called "The Open Arms", and was at once impressed by his great cordiality and his ability to put one at once at one's ease. I wish to say here that Dr. Lewellys F. Barker and Dr. Harold C. Parsons, of the Toronto General Hospital House-Surgeon Staff before me, and Dr. Thomas McCrae, after me, received the same appointment under similar circumstances, and all became members of the Johns Hopkins Hospital Staff.

The Garrett Sanitarium was closed early in September, so I returned to Baltimore with the intention of spending a few days observing the work at the Johns Hopkins Hospital before returning to Canada. As luck would have it, there was a temporary vacancy on the Medical Interne Staff at the hospital, and I was asked to take the appointment as a substitute and entered upon my duties on September 20, 1894. Dr. Osler returned from abroad, where he often spent his summers, on October 1st, and, for some mysterious reason, I was kept on his hospital staff from 1894 to 1901, serving as Resident Physician for the last three years of that period.

I have, with apologies, given this record of how I became connected with the Johns Hopkins Hospital in its earlier days, because here was a new institution where no friction could occur by the reversal of former methods of management and the handling of patients, and where the new heads of the various departments could introduce new ideas concerning the organization of their respective staffs and the methods of teaching medical students. The

hospital was opened for the reception of patients on May 7, 1889, after it had been under construction for fourteen years on the interest of the original endowment fund. It should be mentioned here, however, that the Pathological Laboratory had been completed in 1884, at which time Dr. William H. Welch had been appointed Professor of Pathology in the University and Pathologist-in-Chief to the hospital. During those five years before the opening of the hospital, Dr. Welch had many post-graduate workers in pathology and bacteriology, a number of whom later made important contributions to our knowledge concerning various diseases. Among these may be mentioned Major Walter Reed, who, with his co-workers, demonstrated in Havana that yellow fever was transmitted only by the bite of a special mosquito, the *Aëdes ægypti,* as well as General Sternberg, William T. Councilman, and A. C. Abbott.

Before the hospital was opened Dr. Welch searched for the most promising internist then available to fill the Chair of Professor of Medicine and Physician-in-Chief to the hospital, and recommended to the Trustees of the University and Hospital that Dr. William Osler, who, since 1884 had been Professor of Clinical Medicine at the University of Pennsylvania, be appointed. This recommendation was favourably acted upon. On the recommendation also of Dr. Welch, Dr. William S. Halsted, of the College of Physicians and Surgeons, New York, was appointed Professor of Surgery and Surgeon-in-Chief, and, on Dr. Osler's advice Dr. Howard A. Kelly, of Philadelphia, was made Professor of Gynæcology and Gynæcologist-in-Chief. Thus in May, 1889, the Johns Hopkins Hospital was officially opened with these four great "Chiefs" at the head of their respective departments. It is important to emphasize here that, being an endowed institution, each departmental head had full control of his service and could organize it as he saw fit, and could carry out any personal ideas he might have concerning the organization of his respective staff as well as the method of instructing students.

We are concerned, in this historical sketch, particularly in the medical service as developed by Dr. Osler. It is important to remember that the Johns Hopkins Medical School was not started until 1893, four years after the hospital was opened, so that our own graduates were not available to fill the positions as interns until after the first class graduated in June, 1897. Therefore Dr. Osler was forced, in the early years of the hospital, to select as interns young graduates of promise from various medical schools or hospitals throughout the United States and Canada, preferably men who had had some hospital experience. Up to that time interns rarely remained on a hospital service for more than one year. Dr. Osler, however, introduced a new system which has since become pretty universal at hospitals on this continent, and which has so greatly enhanced the efficiency of the work done by the hospital staff. Promising interns would be asked by Dr. Osler to remain on after their first year in various capacities to work up to the position of Resident Physician. As you probably know Dr. Henri A. Lafleur, of McGill, Montreal, was Dr. Osler's first Resident Physician from 1889, when the hospital opened, until 1891, when he was succeeded by Dr. W. S. Thayer, who remained in this position until 1898. I was the third Resident Physician from 1898 to 1901, having spent four years in various capacities working up to this appointment. This system carried out by Dr. Osler deserves being emphasized, for it furthered the efficiency of the departmental work, and trained a large group of young physicians for future research work, or as teachers or well-trained general practitioners.

Before our first class of medical students reached their fourth year work in the wards in the winter of 1896 to 1897, Dr. Osler gave instruction to post-graduates. Physicians from all parts of the United States and Canada entered up for a six months' course during the winter months, and were given bed-side clinics in the wards by Dr. Osler three mornings a week from 9 to 11 o'clock and on the other three mornings by the Resident Physician. Clinical lectures were given once weekly in the amphitheatre, always with patients to illustrate the disease under discussion.

As has already been stated the Johns Hopkins Medical School was not opened until October, 1893. This was made possible by the generosity of several friends of the University, particularly Miss Mary Garrett, who raised a fund of $500,000, the stipulation being that women should be admitted under the same conditions and with the same privileges as men. In organ-

izing the school the university authorities, in order to secure the best type of students, took the unprecedented stand in requiring those admitted to the school to have a B.A. or a B.S. degree, with a training in chemistry and with a reading knowledge of French and German, so that they could familiarize themselves with the publications in French and German medical journals as they came out.

When the first class reached its fourth year work during the winter term of 1896 to 1897, Dr. Osler established the system of clinical clerkships in the medical wards, where the students spent most of their time during their term in Medicine taking the case-histories, making their own physical examinations of the patients, as well as carrying out special examinations on the blood and body secretions and excretions in the clinical laboratory, preparatory to the bed-side instruction and teaching by Dr. Osler or the Resident Physician the following day. This introduction of the clinical clerkship system, which has now become so universal, is one of Dr. Osler's greatest contributions to medical education, and one of the accomplishments that always gave him the greatest satisfaction.

Instruction in medicine with the third year students was almost entirely carried out in the Out-Patient Department, patients being drawn from this source for observation clinics and for teaching of physical diagnosis in small groups of five or six students to each instructor. I am conscious of the fact that some now maintain that the third year teaching in medicine should be done in the hospital wards, and that the fourth year students should be placed in the Out-Patient Department, where their third year instruction has rendered them capable of coping with the entirely new material presented in a Dispensary Clinic. Didactic lectures, previously all too common in many medical schools, were foreign to Dr. Osler's conception of the proper method of teaching medicine. All instruction was at the bed-side or in the amphitheatre with patients before the student body.

It may not be without interest to relate briefly to you Dr. Osler's system of teaching, as I observed it in the eleven years I was associated with him during his sixteen years' tenure of the Professorship of Medicine. Three mornings a week, Monday, Wednesday and Friday, he made rounds in the medical wards from 9 to 11 o'clock with the fourth year students. He was always on time! The histories of the cases under consideration had been taken and the necessary laboratory examinations had already been made by the fourth year clinical clerks under the supervision of the ward intern. The clinical clerk would then read the history and summarize the results of his physical examination and laboratory studies, and state his impression as to what disease the patient was suffering from. Dr. Osler would then make his own physical examination, done in his incomparable way, and dictate a note for the hospital records. He would then discuss with the students at the bed-side the particular problems presented by the case under discussion, the history of the particular disease, the differential diagnosis, and the therapeutic management. The patient's welfare was always his first consideration. Frequently, he would cite references for which he had a most remarkable memory, and the ward intern would often be dispatched to the library to bring to the bed-side interesting articles in text-books or medical journals bearing on the disease under discussion; or the clinical clerk, in order to teach him how to look up references and how to use the library, would be instructed to have these volumes on hand for the next bed-side clinic. On the other three mornings of the week, Tuesday, Thursday and Saturday, during the same hours 9 to 11, the bed-side instruction was given by the Resident Physician.

Always interested in pathology, if a patient died and permission for a necropsy had been obtained, Dr. Osler would take the group of clinical clerks to the pathological laboratory to have them see whether the autopsy findings accorded with the clinical. The group was always taught that we learn more from our mistakes than from our correct diagnoses, if the lesson is only taken to heart. Rarely did the autopsy reveal a mistaken diagnosis, owing to his incomparably thorough physical examination. Some physicians will never admit mistakes, but Dr. Osler always said that the only physicians who never make incorrect diagnoses were those who never see any patients!

After the ward visit was concluded at 11 o'clock Dr. Osler would then see his patients in the Private Ward and return to a class-room in the Dispensary and conduct from 12 to 1 what he called an "Observation Clinic", with

the whole third year class in attendance. These were delightful and very informal occasions, and many "pearls" fell from his lips never to be forgotten by the students who heard them. Two or three of the most interesting cases would be saved from the Out-Patient Clinic that morning. The case history would be read by one of the third year students and then the patient would be gone over with the student, mainly from the standpoint of inspection; palpation, percussion, and auscultation being secondary considerations, but permitted when indicated. Dr. Osler's purpose in these three weekly clinics was to train the third year students how to use their powers of observation. He constantly reiterated the fact that the diagnosis of a patient's disease often stared one in the face, if one possesses a "seeing eye", has good light, and possesses proper reasoning powers. It is interesting to Canadians to note that often at these clinics, while sitting at the classroom table informally discussing the problem under consideration, it would be observed that he would be scribbling on a scrap of paper. Investigation afterwards would often reveal the fact that he had been repeatedly writing the name of James Bovell, one of the three to whom he had dedicated his text-book.

Every Saturday from 12 to 1 o'clock he would hold a clinic in the amphitheatre for both the third and fourth year classes, and many visiting physicians would attend. I never heard him give a didactic lecture, previously the custom in too many medical schools. Patients from the wards were always presented, the history being read by the fourth year clinical clerk in charge of the case. The main features of the case would then be emphasized by Dr. Osler, and the problems presented by the patient discussed in his illuminating way. After the patient had left the amphitheatre, Osler would frequently exhibit gross pathological specimens to illustrate the disease under discussion. For many years he had a committee of fourth year students tabulate on the amphitheatre black-board all the cases of typhoid or pneumonia patients as they came into the wards, with their age, sex, colour, chief symptoms, complications, treatment and termination. At the end of the term a member of the committee would summarize the cases. The third and fourth year classes thus would be informed of the clinical course of approximately sixty cases of each of these diseases and their knowledge of them thus broadened.

Dr. Osler emphasized the importance of the personal contact between teacher and medical student. Consequently, every Saturday night at 8 o'clock, the group of medical clinical clerks always met at his house at 1 West Franklin Street, where the important cases admitted to the wards during the week were discussed and some of his treasures on the history of medicine shown, while indulging in beer and pretzels.

In order to give you in his own words what Dr. Osler's views were concerning bed-side teaching and how medical students should be taught clinical medicine, I don't think that I can do better than to quote a part of his address entitled "The Fixed Period", being his farewell address to the Johns Hopkins University, delivered on Commemoration Day, February 22, 1905. He says "By far the greatest work of the Johns Hopkins Hospital has been the demonstration to the profession of the United States and to the public of this country of how medical students should be instructed in their art. I place it first because it was the most needed lesson, I place it first because it has done the most good as a stimulating example, and I place it first because never before in the history of this country have medical students lived and worked in a hospital as part of its machinery, as an essential part of the work of the wards. In saying this, Heaven forbid that I should obliquely disparage the good and faithful work of my colleagues elsewhere. But the amphitheatre clinic, the ward and dispensary classes, are but bastard substitutes for a system which makes the medical student himself help in the work of the hospital as part of its human machinery. He does not see the pneumonia case in the amphitheatre from the benches, but he follows it day by day, hour by hour; he has his time so arranged that he can follow it; he sees and studies similar cases and the disease itself becomes his chief teacher, and he knows its phases and variations as depicted in the living; he learns under skilled direction when to act and when to refrain, he learns insensibly principles of practice and he possibly escapes a 'nickel-in-the-slot' attitude of mind which has been the curse of the physician in the treatment of disease. And the same with the other branches of art; he gets a first hand knowledge, which, if he has any sense, may make him wise

unto the salvation of his fellows. And all this has come about through the wise provision that the hospital was to be part of the medical school, and it has become for the senior students, as it should be, their college. Moreover they are not in it upon sufferance and admitted through side-doors, but they are welcomed as important aids without which the work could not be done efficiently. The whole question of the practical education of the medical student is one in which the public is vitally interested. Sane, intelligent physicians and surgeons with culture, science, and art, are worth much in a community, and they are worth paying for in rich endowments of our medical schools and hospitals. Personally, there is nothing in life in which I take greater pride than in my connection with the organization of the medical clinic of the Johns Hopkins Hospital and with the introduction of old-fashioned methods of practical instruction. I desire no other epitaph—no hurry about it, I may say—than the statement that I taught medical students in the wards, as I regard this as by far the most useful and important work I have been called upon to do."

I do not wish to convey the impression that Dr. Osler actually initiated bed-side teaching at the Johns Hopkins Hospital, for many of us older graduates know that a certain amount of this type of instruction was carried out in some of the English, Canadian and German hospitals even before this period. I well remember the bed-side instruction given by my old and revered teachers Drs. James E. Graham, Alexander McPhedran, and W. P. Cavan at the old Toronto General Hospital, while I was a fourth year medical student during the session 1892 to 1893. Dr. Osler did, however, by his example, make bed-side teaching the now universal custom. What he particularly was responsible for and took the greatest pride in was the establishment of the system of clinical clerkships, by which the medical students were brought into intimate contact with the patients in the hospital wards, which became, as it were, their laboratory for clinical training.

One of Dr. Osler's numerous other activities while at the Johns Hopkins Hospital was the organization, just before he left for England in 1905 to take up the Regius Professorship of Medicine at Oxford, of the first Interurban Clinical Club, modelled in a certain measure after a similar Interurban Surgical Club which had been started three years before, and of which, I recall, Harvey Cushing was a charter member. This Interurban Clinical Club held its first meeting in Baltimore late in May, 1905, with Dr. Richard Cabot, of Boston, as its first president. The membership was composed of six of the active young teachers of clinical medicine in the medical schools of Boston, New York, Philadelphia and Baltimore. I had the good fortune to have been one of the charter members of the Baltimore group. The club has since held two meetings a year, rotating in the various cities. The chief purpose of the club was to observe the methods of clinical teaching in the various medical schools, and it has been an important factor in the encouragement of bed-side instruction. Dr. Osler spent the last two days in Baltimore before leaving for Oxford attending the first meeting of this organization. These two clubs have been the inspiration for the organization of the numerous other similar clubs throughout the United States and Canada, and these various organizations have undoubtedly been a potent factor in helping to encourage bed-side medical instruction.

When medical students are graduated, if they possess a proper viewpoint, they realize that they are just beginning to know something about the problems of disease and that their knowledge of clinical medicine has really only been initiated. Knowing as we do what Dr. Osler has taught us concerning the importance of bed-side instruction, there is nothing better that the graduate physician can do to increase his knowledge of clinical medicine than to grasp every opportunity to secure such instruction at the bed-side under capable teachers with experience.

I wish to call your attention in this connection to a practice that has been in vogue for several years at the Johns Hopkins Hospital under the present Professor of Medicine, Dr. Warfield T. Longcope. I refer to what are called staff rounds, which are held in the medical wards from 9.30 to 10.30 a.m. on Thursday morning each week. The members of the whole hospital and dispensary medical staffs, including the laboratory assistants and physicians from any of the other departments of the hospital and medical school who care to attend, are invited to the medical wards, and four of the most interesting and puzzling cases are pre-

sented under the direction of Dr. Longcope. The average attendance is about fifty. The medical students are not present on these occasions. The history of each case is read by one of the interns or senior assistants, and then there is a free discussion of the problems presented by the individual case. Those who care to do so may personally examine the patient. The chief articles in the literature dealing with the disease under discussion have been brought together by the assistant and are handed around for the benefit of those attending these exercises. Most interesting discussions occur concerning the problems in differential diagnosis and treatment of the respective cases. Following the staff rounds the whole group then retires to one of the class-rooms, where there is a large illuminating cabinet, and during the next half hour Dr. J. W. Pierson, Director of the Department of Roentgenology, demonstrates the x-ray films of four of the most interesting cases that have come into the medical wards during the preceding week, after an assistant has briefly summarized the clinical history. There is free and informal discussion of the x-ray problems in each case. These two exercises are very popular and have been of great educational value to the large group of physicians who attend them.

That the general practitioner is conscious of the advantage of similar bed-side instruction is shown by his attendance at post-graduate courses at various teaching hospitals where such courses are available and where bed-side teaching is emphasized. It is also evidenced by the large number attending the numerous organizations that hold annual meetings, such as those of the American College of Physicians and similar societies, at which bed-side clinics and clinical lectures, with the demonstration of patients, are featured. I appreciate the fact that the local profession in Hamilton has recognized the importance of such instruction, because as far back as 1917 the Hamilton Academy of Medicine organized an Annual Clinical Day, at which trained clinicians from both sides of the line have conducted bed-side clinics in your City Hospital. I see no serious reason why similar instruction should not be carried out in the hospitals in smaller cities under the auspices of the local county or city medical societies.

Unfortunately, in recent years, there has been a growing tendency for physicians to attempt a short cut in making a medical diagnosis by the utilization of x-rays, electrocardiograms, and other numerous laboratory methods now at our disposal, and to neglect the careful and thorough physical examination of the patient. These measures have undoubtedly increased the cost of medical care. I would not, for a moment, minimize the value of these laboratory aids, but I want to emphasize the fact that they are often not essential but are merely aids in diagnosis. The greatest diagnosticians I have known, and this is best illustrated by the man whose name we are memorializing today, have been those who made careful, painstaking physical examinations of their patients and who have correlated their physical findings with the patient's subjective symptoms.

In conclusion, I should like to refer to a few of those great clinicians of the nineteenth century, who, without the elaborate laboratory and technical facilities we possess at the present time, but who by their keenness of observation and analytical minds, aided by the fact that they followed their cases to the autopsy room, described for the first time various diseases familiar to us today, and who have been immortalized by having these diseases named after them. The symptom-complex which we commonly speak of as exophthalmic goitre was first clearly described by Parry, the old Bath physician, in 1825, later by Graves of Dublin in 1835, and still later by Basedow in 1840. Dr. Osler frequently insisted that if this disease should be named after any one man Parry should have that honour. Then we have that great group of Guy's Hospital physicians—Richard Bright, Thomas Hodgkin, Thomas Addison, and Sir William Gull. Bright, in his "Reports of Medical Cases" published in 1827, gave his original description of essential nephritis, and distinguished clearly between cardiac and renal dropsy. In this memorable communication there are coloured drawings of the kidneys, representing various types of nephritis, that would do credit to any modern artist. In 1832, Hodgkin recorded a series of cases of enlargement of the lymphatic glands and spleen, to which Wilks later applied the name "Hodgkin's disease". In a monograph entitled "The Constitutional and Local Effects of

Disease of the Suprarenal Capsules", published in 1855, Addison described the disease of the adrenal glands now commonly known by his name. In the same year he described clearly the clinical features of pernicious anæmia, the so-called "Addisonian anæmia". What a tribute to the keenness of observation of one man! To be strictly correct, historically, it should be mentioned that Addison had described both these diseases as early as 1849 in a communication before the South London Medical Society (*London Med. Gaz.*, 1849, **43**: 517). Sir William Gull, the fourth of the great Guy's Hospital group, first described myxœdema in 1873, and it is sometimes called Gull's disease.

The great Dublin group of clinicians must not be overlooked. In the *Edinburgh Medical and Surgical Journal* (1832, **37**: 225-245) Sir Dominic Corrigan, the great Dublin physician, gave his classical account of aortic insufficiency, and described the characteristic "water-hammer" pulse, with which his name is so frequently associated. He also noted the expansive pulsation of certain aneurysms (Corrigan's sign). Graves, I have already referred to. Robert Adams, as early as 1827, gave a classic account of heart-block (*Dublin Hosp. Rep.*, 1827, **4**: 396). William Stokes studied the same condition, and in 1846 published his celebrated account of Stokes-Adams disease (*Dublin Quart. J. Med. Sc.*, 1846, **2**: 73-85).

Pierre Marie, of Paris, described acromegaly in 1885, hypertrophic pulmonary osteo-arthropathy in 1889, and hereditary cerebellar ataxia in 1893.

What an impressive list this is! These names have been immortalized as a result of the publication of observations made chiefly on hospital patients without the elaborate laboratory aids we possess at the present time. The work of these great men shows what careful bed-side observation can accomplish, and this was frequently emphasized to his students by Sir William Osler, whose memory we are cherishing today. To emphasize what he considered his greatest contribution to medical education may I repeat his words "I desire no other epitaph than the statement that I taught medical students in the wards".

AN ATTEMPT TO INHIBIT THE DEVELOPMENT OF TAR-CARCINOMA IN MICE

(SECOND REPORT)

BY J. R. DAVIDSON, M.D.,

Winnipeg

IN a recent number of the *Journal*[1] a preliminary account was given of an attempt to inhibit the development of tar-carcinoma in mice by feeding them a special diet of which the most outstanding feature seemed to be an excess of vitamin E. In the present note an even more successful experiment is recorded.

The diets used were very similar to those employed in the earlier experiments. A control group (III) of 9 male mice, after weaning, was fed throughout the experiment a diet consisting of oats, bread, carrots or turnips, milk and water. Lard was included in the diet at the stage at which tarring was commenced.

A second group (IV) of 10 male mice (offspring of the same father and of sibling mothers) was fed this same diet from weaning to the commencement of tarring. They were then transferred to a diet consisting of wheat germ cereal, wheat germ oil, lettuce and milk.

Tarring was commenced at the end of the 12th week and continued twice a week for four months.

The results are shown very clearly in the seven photographs in Figs. 1 to 4. They are also shown in tabular form in Table I, along with those of a group (V) of 10 females of similar parentage placed on a high vitamin diet at the end of the second week after commencement of tarring. (This group at the 45-day-period, corresponding to the photograph in Fig. 1 B, exhibited two animals with papillomata. Up to 142 days there were no further growths, nor were there marked changes in these two cases).

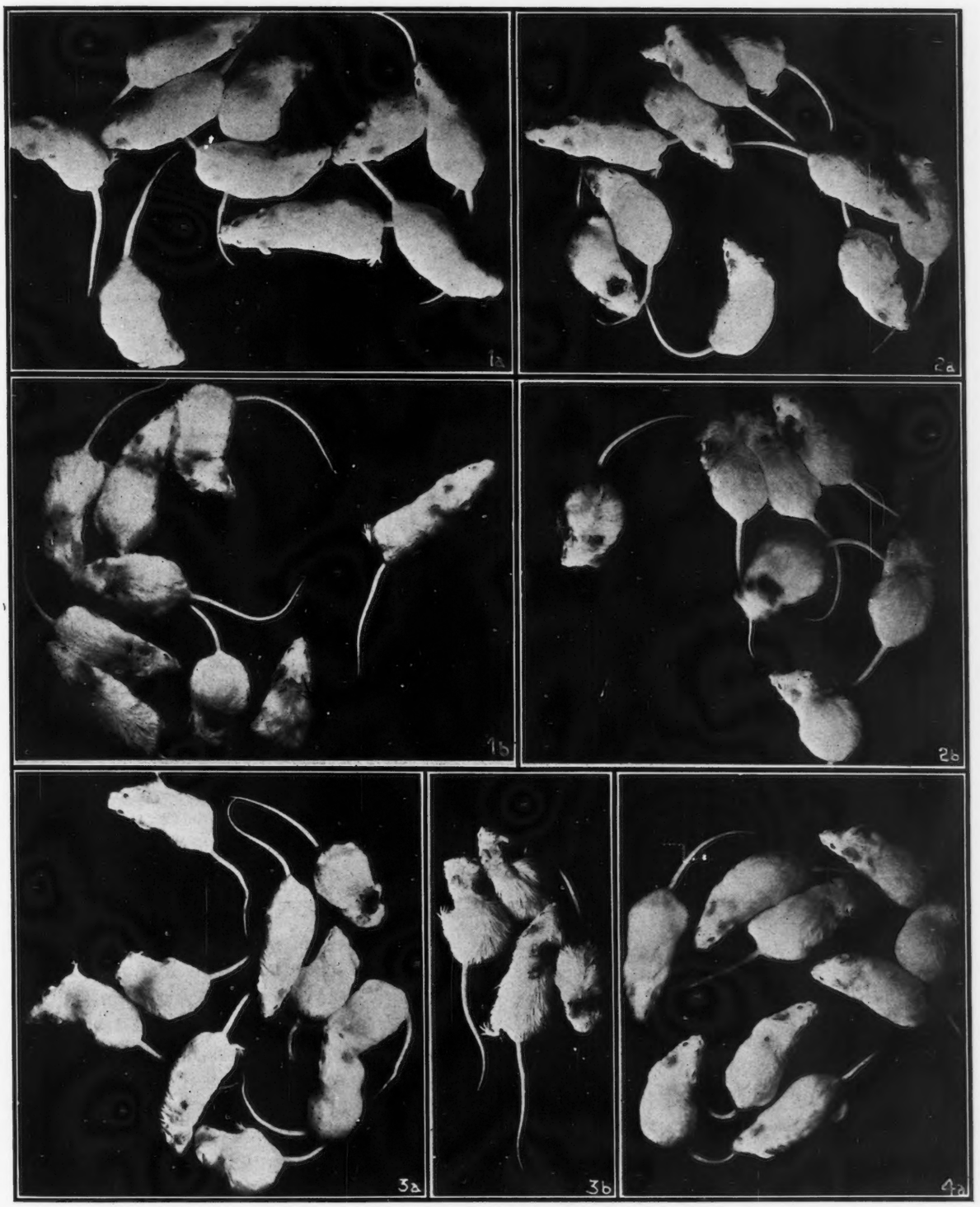

FIG. 1a.—Group IV. High vitamin diet. Fifty days after cessation of tarring. One mouse showed a small papilloma. 1b.—Group III. Control group. Forty-five days after cessation of tarring. All mice showed papillomata.

FIG. 2.—Both groups 78 days after cessation of tarring. 2a.—(As in Fig. 1). Two mice showed papillomata. One growth became infected through fighting. 2b.—(As in Fig. 1). Seven survivors. Two mice had died. Autopsy showed in each case a carcinomatous growth.

FIG. 3.—Both groups 115 days after cessation of tarring. 3a.—(As in Fig. 1). The same two mice with papillomata showed about the same appearance as in Fig. 2. None of the others showed growths. 3b.—(As in Fig. 1). The four survivors. In the interval five mice had died. All had carcinomatous growths.

FIG. 4a.—(As in Fig. 1). Taken 143 days after cessation of tarring. The animal with the infected growth, and otherwise injured through fighting, had died on the 140th day. Autopsy showed no carcinoma present. The remaining animals of the control group had died, the last on the 135th day; all showed carcinomatous growths at autopsy.

These results are in complete agreement with those recorded in the first report, permitting the conclusion to be drawn that the diet rich in vitamin E maintains mice in a condition which is more resistent to the carcinogenic factors in tar than that produced by ordinary diets. Again it must be stressed that this "anti-carcinogenic" diet is not only unusually rich in vitamin E, but is also rich in vitamins B_1 and B_2, while it exhibits many other qualitative differences from the control diet employed, so that the specific factor or combination of factors in it which confers greater resistance on the mice cannot yet be stated.

The strain of mice (whether by selection or from some other cause) which has been used in these recent experiments seems to be becoming increasingly susceptible to the carcinogenic agents in tar, as the accompanying data indicate. This strengthens still further the conclusions that have been drawn as to the anti-carcinogenic value of the wheat germ cereal—wheat germ oil—lettuce diet.

A group of 12 female mice were kept on the control diet and tarred during the usual four-months' period, at the end of which all showed papillomata. After a further 40 days the growths were removed from four animals and examined, at 43 days the growths from four others, and at 51 days those from the remaining animals. All the twelve biopsies revealed that the growths were carcinomatous.

TABLE I

NUMBER OF DAYS BEFORE DEATH OCCURRED AFTER CESSATION OF TARRING

Group III. Males Control diet			*Group IV. Males High vitamin E diet*			*Group V. Females High vitamin E diet*		
Mouse No.	*Days*	*Carcinoma*	*Mouse No.*	*Days*	*Carcinoma*	*Mouse No.*	*Days*	*Carcinoma*
1	45	Present						
2	74	Present						
3	79	Present						
4	92	Present		(During this period no mouse of this group died.)			(During this period no mouse of this group died.)	
5	110	Present						
6	117	Present						
7	121	Present						
8	124	Present						
9	135	Present						
			1	140	Absent	1	164	Present
						2	185	Present
				(All the other mice of this group were alive and in good condition on the 146th day. The single animal with a growth showed no marked change.)			(The other 8 animals were still living, healthy, and free from growths at the 225th day.)	

A second group of 10 males, treated in exactly the same way, all exhibited papillomata. These were removed and examined on the 14th day after cessation of tarring. All were carcinomatous. A third group of 10 females showed precisely the same results.

The mice in these three groups have been transferred to the high vitamin diet and their subsequent history will be reported later.

My thanks are again due to Dr. Sara Meltzer, Assistant Pathologist of the Winnipeg General Hospital, for carrying out the histological examination of the growths.

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THE BACTERIOLOGICAL DIAGNOSIS OF WHOOPING-COUGH*

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PART I. THE COUGH-PLATE METHOD

THE following report summarizes the results of a three years' study of the use of bacteriological methods in the early diagnosis of whooping-cough. In 1578 Baillou reported, what is believed to be the first authentic description of an epidemic of whooping-cough. Not until 1900 however, did Bordet find the causative micro-organism in the sputum of his five months old daughter. In 1906, Bordet and Gengou[1] successfully cultivated *H. pertussis* on artificial media. Chievitz and Meyer,[2] 1916, were the first to use the cough-plate and found that a high percentage of their cultures were positive for *H. pertussis*. Madsen[3] in 1924, followed with a paper on the results of 914 cases of whooping-cough, using the cough-plate culture method, and demonstrated 75 per cent positive in the catarrhal stage of the disease. Lawson and Mueller,[4] 1927, in the examination by this method of 533 cases of whooping-cough, obtained 59 per cent positive in the catarrhal stage. Gardner and Leslie,[5] 1932, demonstrated 75 per cent of positive cultures in 47 cases examined in the catarrhal stage. Sauer,[6] 1932, obtained 99 per cent positive cough-plates from 300 children in the early stages of the disease. Macdonald and Macdonald,[7] 1933, vaccinated two of four brothers with a vaccine prepared from a freshly isolated strain some few months before instilling a freshly isolated living culture intranasally into each child. The two unvaccinated children developed typical whooping-cough, as gauged by clinical symptoms, which was verified bacteriologically. The two vaccinated children were protected. All these investigations point conclusively to the fact that *H. pertussis* is the sole etiological agent of whooping-cough.

Preparation of the medium.—Five hundred gram of potato, freshly peeled and sliced, 40 c.c. glycerine, and 1,000 c.c. of distilled water are boiled in a covered kettle until the potatoes are soft. The contents are then made up to the original volume by adding distilled water. The mixture is now strained through gauze and pressed dry, either by hand or press. Then 1,500 c.c. of distilled water, 9 grms. of sodium chloride (0.6 per cent), and 60 grams of agar are added to 500 c.c. of the above potato filtrate. The agar is dissolved by heating; the potato extract is then added and mixed thoroughly. Into test tubes 6 inches by ¾ inch approximately 15 c.c. of medium are poured and autoclaved at 250° F. for 30 minutes. When pouring a plate the contents of the tube are melted, allowed to cool to 45° C. and 7 to 8 c.c. of citrated sheep's blood are added to each tube (approximately 30 to 40 per cent). The blood is mixed with the medium and poured into sterile Petri dishes. The finished plate should be cherry red and have a moist smooth surface.

The technique of taking cough-plates.—Cough-plates have been taken by us in duplicate, and are exposed to 2 to 3 natural spasms of coughing at a distance of approximately 3 inches. They are then returned to the laboratory as soon as possible and the colonies looked for after incubation 3, 4 and 5 days at 37° C. It is best to give the child a glass of water to drink, which tends to diminish the number of contaminants. It may be necessary to use a tongue depressor or pressure on the trachea to produce coughing.

Our studies consist of the examination of 333 children by the use of the cough-plate culture method.

An analysis of the results from the cultures of these children showed that of 198 children with whooping-cough from whom cultures were taken during various stages of the disease 119 were positive; 135 children who did not have whooping-cough and were suffering from some acute upper respiratory infection were found to be negative in all instances. Recently, Wilcox[8] has examined cough-plates from children with other diseases and found them negative for *H.*

* From the wards and laboratories of the Hospital for Sick Children, the Department of Pædiatrics, under the direction of Alan Brown, and the Connaught Laboratories, University of Toronto.

pertussis. These results are in accordance with our findings and indicate that *H. pertussis* is found only in individuals suffering from whooping-cough. Kristensen[9] was unable to demonstrate the carrier state in normal persons or in those in contact with the disease. The following table summarizes the results obtained when analyzed from the first to the sixth week of the disease.

Analysis of 198 Cases of Clinical Whooping-Cough

Week of disease	*Cases examined*	*Cases positive*	*Percentage positive*
1st	64	63	98
2nd	54	43	79
3rd	45	9	20
4th	16	3	18
5th	17	0	0
6th	2	1	

In general, the earlier in the course of disease the cultures were taken, the greater were the number of colonies of *H. pertussis* on the plates. (See Figs. 1 and 2). In two instances a pure culture was obtained. (See Fig. 3). The plates were examined for typical colonies of *H. pertussis*, 3, 4 and 5 days after incubation at 37° C. The colonies are opaque, with a mirror-like surface, a smooth border, and appear as minute, heaped up "half-pearls". By the fourth day the colonies are usually fully formed. Films were made of the colonies of *H. pertussis* and examined microscopically before reporting the result to the attending physician. The 119 strains were subsequently subjected to certain laboratory tests for complete identification as follows.

(a) *Morphology*.—When films of colonies were examined microscopically from cough-plates, a characteristic Gram-negative ovoid or coccobacillus was seen. Occasional forms appeared to be end to end, and were uniform in size, with no tendency to pleomorphism.

(b) *Utilization of carbohydrates*. — When planted in media containing dextrose, maltose and saccharose no acid was formed by any of the 119 strains tested.

(c) *Serology*.—Each of the 119 strains isolated was then subjected to macroscopic agglutination. Dilutions of 1 in 40 to 1 in 1280 of the following sera were made in physiological saline; normal rabbit serum, normal horse serum, serum produced from inoculating a horse with five stock strains Nos. 237, 255, 189, 778 and 820, and a monovalent rabbit serum made from a freshly isolated strain. For the agglutination tests an antigen was prepared from a third or fourth subculture from each of the 119 strains. Complete agglutination occurred in the monovalent rabbit serum up to the 1 in 1,280 dilution. No agglutination occurred with the normal rabbit or horse serum or horse serum prepared with stock strains. This test was used as a final identification, and suggests that all of our 119 strains were identical.

Ordinarily, there is little attempt at isolation of a child with a cough even by conscientious parents until the whoop is established. On the other hand, it is not difficult to persuade a mother to restrict the activities of her child for a few days while awaiting a report from the laboratory. In this respect the cough plate, when positive, not only gives satisfaction to the parent earlier than the usual accepted method of diagnosis, but offers information that is valuable for earlier isolation, at a more infective stage of the disease, thus limiting the spread of the infection to other children. We feel that excellent results may be obtained with this method if one individual familiar with the clinical difficulties and laboratory technique is carrying out the work.

In conclusion, the following facts are noteworthy.

1. The cough-plate culture method is the most efficient means of establishing an early diagnosis of whooping-cough.

2. Ninety-eight per cent of our cases were positive in the 64 children examined during the first week of the disease.

3. In 2 instances pure cultures were obtained on the original cough plates.

PART II. COMPARISON OF FRESHLY ISOLATED AND STOCK STRAINS OF *H. pertussis*

In Part I of this communication, we have reported the isolation of 119 strains of *H. pertussis* from patients with whooping-cough. During the investigation it very soon became evident that there were striking dissimilarities between freshly isolated and stock strains of this microorganism. Leslie and Gardner[10] described four distinct "phases" amongst the cultures studied. More recently, Coffey[11] and Shibley and Hoelscher[12] have drawn attention to a variety of differences between old and new strains. The latter authors suggest the conventional designa-

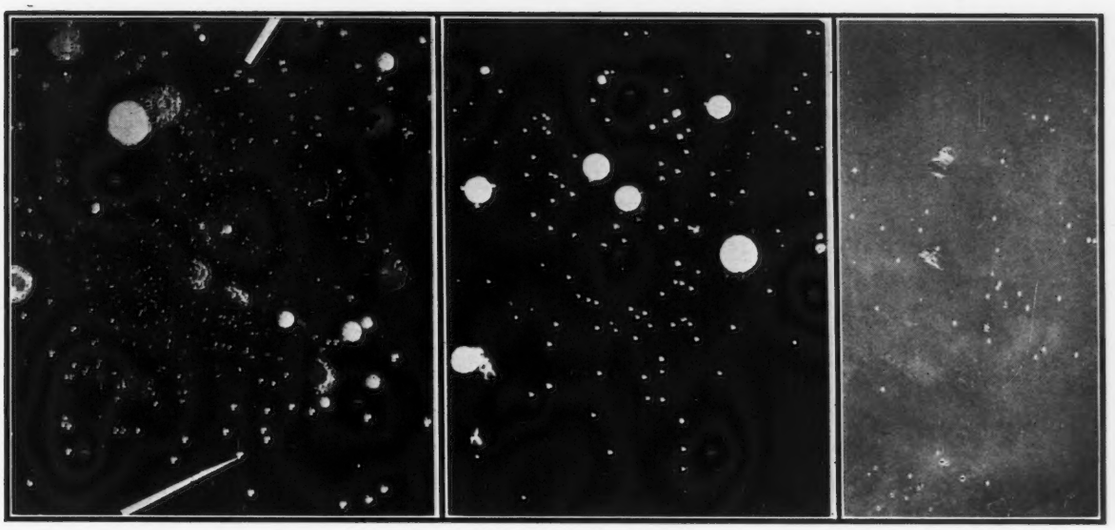

FIG. 1 FIG. 2 FIG. 3

FIG. 1.—Cough-plate obtained 2 to 3 days after onset of first symptoms of whooping-cough. Note the myriads of colonies of *H. pertussis* and, except for a few mouth contaminants, the relative purity of culture.

FIG. 2.—Cough-plate obtained 6 days after the onset of first symptoms of whooping-cough. Note the relative purity of the culture.

FIG. 3.—Pure culture of *H. pertussis* on original cough-plate from patient. Note the white spots which are the colonies of *H. pertussis.*

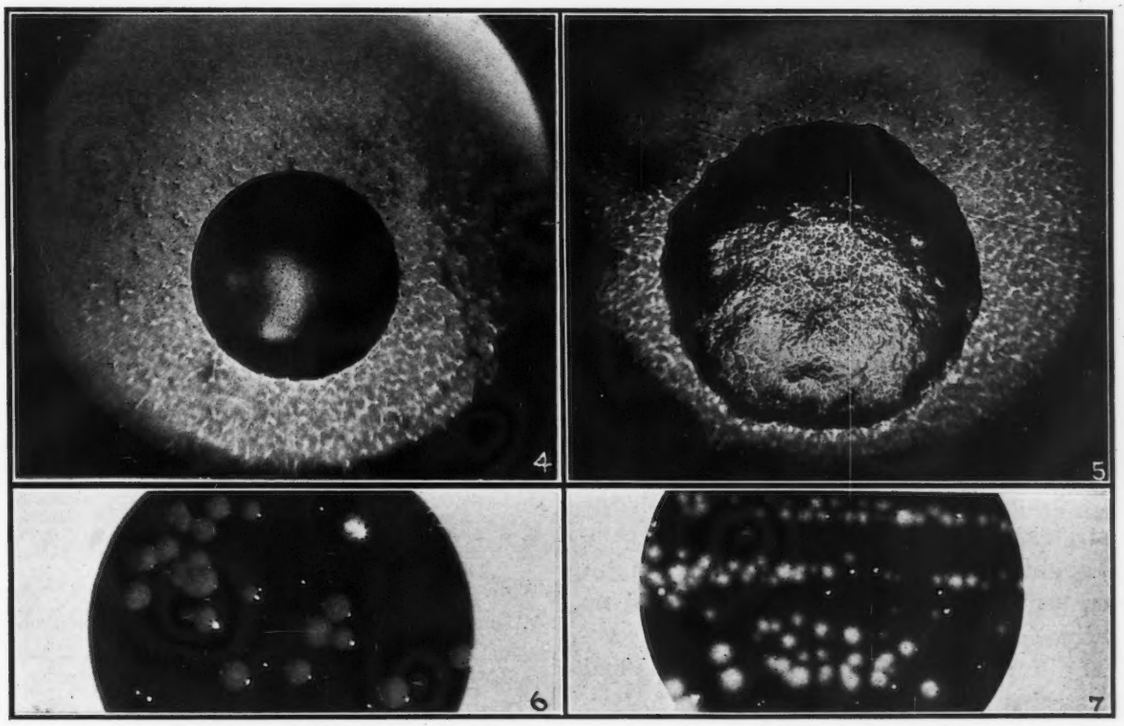

FIG. 4.—Microphotograph of a colony of a freshly isolated strain. Note mirror surface and regular, demarcated border.

FIG. 5.—Microphotograph of a colony of a laboratory stock strain of *H. pertussis.* Note the roughened, non-reflecting surface and irregular border.

FIG. 6.—*H. pertussis* after a few subcultures, showing the raised pearl-like, clear-cut colony of a freshly isolated strain. Note the regular outline with mirror-like reflection.

FIG. 7.—*H. pertussis* after several years subculture, showing the white, rough surface colony. Note the hazy outline of the colony with no mirror-like surface.

tion "S" and "R" to characterize the two types. It is the purpose of this report to present corroborative and additional evidence of these variations in 119 freshly isolated and 5 stock strains of *H. pertussis* (Nos. 237, 255, 189, 778, 820).

(a) *Morphology.*—All of the recently isolated strains conformed to the description of various authors, namely, a very short, Gram-negative cocco-bacillus, in contrast to the long, thin forms observed in the stained films of five cultures carried for at least six years on various media and during the past two years in this laboratory on the blood, potato, glycerine agar medium. Three strains of those freshly isolated from patients were cultivated on the above medium for a period of upwards of two years. Transfers were made every ten to fourteen days. The morphological characteristics remained unaltered except for the occasional appearance of longer forms.

(b) *Culture.*—On this medium a freshly isolated strain grows as small discrete, elevated colonies with a mirror-like surface, a regular, clearly defined border, which appear like "half-pearls" (see Fig. 4). The growth on this medium does not appear until the end of two to four days' incubation at 37° C. Growth of the old strains on the same medium is evident within twenty-four hours' incubation at 37° C., produces less elevated, much larger, colonies with a rough surface which does not reflect light and has an irregular border. (See Fig. 5).

Figs. 6 and 7 show several colonies of a freshly isolated and of a stock strain. The new strains tested do not grow on heated blood agar (80° C. for 15 minutes), whereas old strains grow luxuriantly on this medium.

(c) *Serology.*—Macroscopic agglutination tests were set up, as described in Part I, with the 119 strains. In every instance there was complete agglutination with the monovalent rabbit serum, usually to a titre of 1 in 1,280, and no agglutination with the control sera. The serological differences between freshly isolated and stock strains are clearly shown by the following facts. The serum of a convalescent, obtained 6 to 8 weeks after the onset of whooping-cough, agglutinated the freshly isolated strain "K". The agglutinins of this serum were completely absorbed by a suspension of "K". Further, serum from each of two children obtained 1 to 2 months after the last dose of a vaccine made from a freshly isolated strain (a total of approximately 70 billion bacilli given over a four-weeks' period) behaved in a similar manner to the convalescent serum in regard to agglutination and absorption of agglutinins. In contrast, stock strain 820 was not agglutinated by these three sera. Recently we have demonstrated that 5 freshly isolated strains, chosen at random from cases of whooping-cough, are identical when subjected to reciprocal agglutination and reciprocal absorption of agglutinins. This finding, coupled with the fact that all of the 119 strains were agglutinated with a monovalent rabbit serum, suggests that they constitute a homogeneous serological group.

These observations have emphasized the dissimilarities between new and old strains. The experience of Toomey, McClelland and Leider[13] and Shibley[14] indicate that old strains have lost their invasive properties. Whooping-cough was experimentally produced in monkeys with new strains but not with old. This fact and the results presented in this paper strongly suggest the desirability of selecting strains of *H. pertussis* for the preparation of vaccine which strictly conform to those qualities which characterize freshly isolated strains. Sauer[15] emphasized this contention and has in addition advocated a much greater dosage than commonly recommended. The excellent results published by him are in all probability due to the fact that cognizance was taken of these two factors in the preparation of his vaccine.

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MALIGNANT CONDITIONS OF THE SKIN AND THEIR TREATMENT BY RADIATION*

BY R. K. PATERSON,

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IT was suggested to me that I prepare for this meeting a short paper on malignant conditions of the skin. So it has fallen to my lot to bring before you this field, where cancer is most common and radiation therapy most successful.

The earliest attack on cancer with radium was naturally in the skin group, and since then so many papers have appeared on skin cancers and their treatment that I am afraid many of you will consider the subject too worn. I hope, however, to make my remarks more particularly of value to the general practitioner, for he is generally the first to see these cases; the radiologist and the dermatologist may find little of interest in my paper. I shall try to marshal some of the facts about skin cancers and to indicate some of the generally accepted principles of their radiation treatment.

Frequency; types; malignancy. — The skin provides the greatest number of human cancers. This is to be expected, when we consider the extent of the body-surface, any part of which may become the seat of a malignant growth. Skin cancers are seldom seen before the age of 40 years, and appear with increasing frequency as the years pass. They are chiefly of two types, the basal-cell type, or rodent ulcer, and the squamous-cell type.

Basal cell cancers are much more common than squamous. They appear mostly in older subjects, and their most common seat is the face. They grow slowly, often very slowly, sometimes taking a few years to reach the size of a five-cent piece. They tend to be elevated and to have a rolled border surrounding a crater-like ulcer. They never metastasize. I think there is no case on record in which a basal-cell cancer has formed metastases. But as time goes on a basal cell growth may become a mixed-cell growth and metastasize with the help of its more malignant partner, the squamous cell. Basal-celled cancers are quite radio-sensitive, and can be permanently cured by comparatively small doses, with good cosmetic results.

Squamous-cell cancers are not so common as the basal, but they appear in younger subjects. They tend to be most common where skin meets mucous membrane,—the mouth, anus, penis and vulva are favourite seats. But they may come on any part of the body, and the back of the hand and the ear are fairly common sites. They may begin as an elevated, even warty, growth, or as a small hard nodule that readily bleeds and later forms a friable, granulating ulcer. They grow much more rapidly than the basal-cell cancer and soon ulcerate and infiltrate. They readily metastasize to the nearest lymph glands. Compared with the basal-cell type they are radio-resistant. When we know we are dealing with a squamous-cell cancer the nearest lymph gland area should be heavily radiated, even though no palpable glands can be detected. They are much more malignant than basal-cell growths and radiation failures in skin cancers are nearly all with the squamous-cell variety.

Causes.—The relation of chronic irritation and trauma to the development of skin cancers is recognized by all. Sun, wind, great differences in temperature, dirt, physical and chemical injuries, are among the chief chronic irritants responsible for skin cancers. Of these "weather" is the greatest offender. Sun, wind, and dirt, with varying temperatures, and in heavy smokers, form an irritating group that certainly is the exciting cause of nearly all basal-cell growths. The fact that these cancers come mostly on the face and neck in farmers, labourers and outside workers, and over 65 per cent in men, is convincing proof.

Keratoses, whether senile or seborrhœic, are prone to become the seat of skin cancer, especially the senile type that is chiefly brought on by exposure to the weather. It is often im-

* Read at the Fifty-fourth Annual Meeting of the Ontario Medical Association, Toronto, May 31, 1934.

possible to say whether an area of senile keratosis has passed the pre-cancerous state. But as these lesions respond so readily to radiation, I believe they should all be radiated, if for no other reason than to obtain the clean good cosmetic effect that results.

Leucoplakia may be the seat of cancer growth. But this condition is generally found in excessive smokers, or those wearing plates or heavy bridge work. The indication is to remove the exciting cause and keep the case under observation. Thickening of the mucous membrane or any break of the surface in an area of leucoplakia is an indication for active treatment.

Scars, warts, moles, nævi, papillary growths or sebaceous cysts, subject to irritation and injury, or showing in themselves any degeneration, are likely seats for cancer development. A few years ago I saw a huge scalp scar caused by an injury twenty years before break down into an extensive cancer that rapidly proved fatal. A few months ago we had a rapidly growing cancer which developed in a large degenerating wen, but this responded completely to adequate radiation.

Lupus vulgaris and lupus erythematosus.—It is not uncommon to see either of these conditions take on malignant growth, and it is very important not to overlook such a change when it occurs.

EARLY DIAGNOSIS

Early diagnosis is all important in skin cancer, as in cancer elsewhere. I would like to refer you to a paper on "The early diagnosis of cancer of the skin" by Cleveland,[1] for an excellent and comprehensive presentation of this subject. The educational campaign for early diagnosis is bearing its best fruit in the skin group. This is to be expected, for people can at least be observant of their surface. Yet it

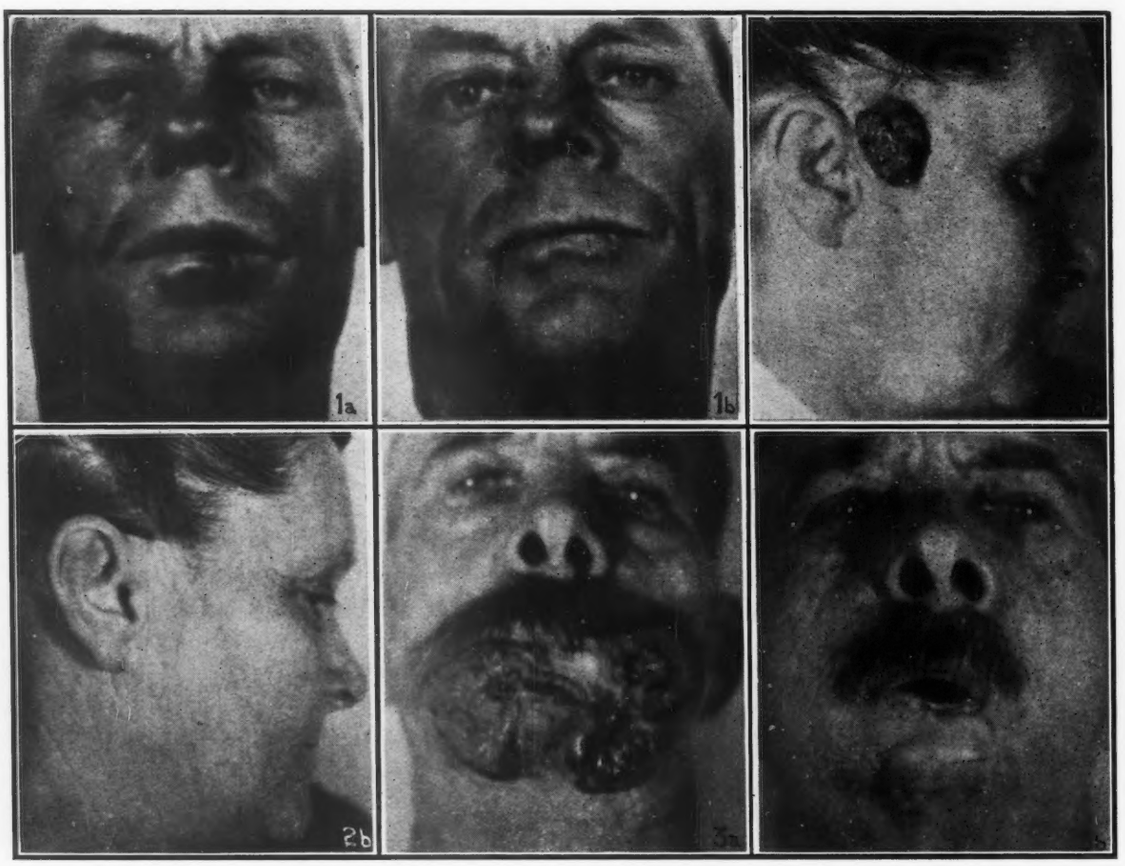

FIG. 1a.—Small squamous cancer near the centre of the lower lip; growing 5 months when first seen. 1b.—No recurrence after 11½ years. If all lip cases could be seen at this stage 90 per cent could be cured by radium.

FIG. 2a.—Cancer on the right temple, growing 1½ years when first seen. 2b.—No recurrence after 5 years.

FIG. 3a.—Cancer destroying almost the whole of the lower lip and invading most of the chin, growing for 3 years when first seen. 3b.—No recurrence after 4½ years.

is a lamentable fact that we are still seeing many far-advanced cases. Even last winter I treated the largest skin cancer I ever saw; a growth on an old man's temple, neglected for two years, covered about half the side of his head. Yet this growth is already nearly cured. What suffering to the patient and distress to the family could have been saved had it been dealt with two years ago! And the patient lives only four miles from Ottawa! There should be no reason today for skin cancers not being seen in the pre-cancerous or early cancer stage. Then 100 per cent could be cured by adequate radiation. Even as it is, over 90 per cent are being permanently cured by radiation, assisted in some suitable cases by endothermy and surgery. Failures are mostly in advanced cases that have involved bone or cartilage, or spread to the nearest lymphatic glands.

TREATMENT

The high percentage of cures in skin cancers can be readily explained. Being on the surface, they can be early seen. They grow slowly, so the sufferer has ample time to seek relief before the disease is advanced. The majority are radiosensitive, and the great majority are of the basal-cell type, and do not metastasize. They are readily accessible for radiation therapy.

To deal adequately with the treatment would take more than my total time. Dr. Richards[2] in an excellent address given two years ago in Toronto at the annual meeting of the Ontario Medical Association dealt thoroughly with the treatment of external cancer. I wish, however, to direct your attention to some of the most important points.

The great majority of skin cancers can be adequately treated by administering the total dose at one sitting. This is generally true, but of course is not applicable in all cases. Three to five erythema skin units will kill all basal-cell growths, unless too large: but it will take 6 to 9 erythema skin units to kill most squamous-cell growths. Every case requires individual consideration as to the best method of radiation. Very superficial growths are best dealt with by surface application of radium. Growths over one-quarter of an inch deep, and larger infiltrating ones require filtered radium at a distance, or interstitial implantation, the filtration ranging from one to three m.m. brass or 0.5 to 2 m.m. platinum, and the distance from one to five cm. depending on the depth of the growth and the amount of infiltration. The locations presenting the most difficulty are: eyelids, ear, cartilage of the nose and the back of the hand, and early attack in these cases is essential.

Eyelids.—The conjunctiva is the only radiosensitive tissue about the eyeball, and early eyelid cases can be treated with only a moderate conjunctivitis resulting, which will clear up in a few weeks, while late cases, where the disease has spread back along the eyeball, or has involved the conjunctiva, will require enucleation to effect a cure. Eyelid cases must be treated early for the best cosmetic and functional results, especially those involving the inner cauthus, to avoid stricture of the lachrymal duct. Interstitial radium implantation, as advised by Martin,[3] of the Memorial Hospital, gives, I believe, the best results in most eyelid cases.

Ear.—Cancer involving a cartilage surface is always more difficult to treat. Early cancer on the ear will generally respond quite readily to radiation, but when the cartilage is involved very heavy radiation is required, resulting in much pain and very slow healing. If there is much cartilage involvement these cases are best treated by endothermy followed by radiation.

Nose.—The same applies to cancer involving the cartilage of the nose, and to avoid loss of tissue and an unsightly result treatment in the early stages is essential.

The back of the hand.—Cancers in this region occur mostly in elderly people in whom the nutrition of the area is poor. They are often squamous-celled, the underlying tendons are close and can be readily undermined, and when the cancer is advanced the case is serious. Here again, early cases will respond quite well, but advanced cases may require amputation to avoid a fatal result. Out of 15 cases we had 1 which required amputation after resisting radiation. This patient has now remained well for over two years; a second refused both amputation and radiation and his case proved fatal; a third has also refused amputation and a fatal result is impending.

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GONOCOCCAL TENOSYNOVITIS OF THE HAND*

BY D. W. G. MURRAY AND J. R. E. MORGAN,

Toronto,

EXTRA-GENITAL gonococcal lesions have been described in almost all parts of the body, arthritis being among the most frequently noted. Osler,[1] Kaufmann,[2] Kanavel,[3] Topley and Wilson,[4] Garrod,[5] Larrabee[6] and others mention the occurrence of gonorrhœal tenosynovitis, but present no figures relative to its incidence. Jeck[7] and Blumer[8] have stated that gonococcal infection of tendon sheaths, while usually associated with arthritis, occasionally occurs independently. There is a marked variation in the reported frequency of gonococcal arthritis, the spread ranging from 1 to 10 per cent of cases of male gonorrhœa, quoted by Blumer,[9] states that 4 per cent of a series of 2,681 cases of gonorrhœa in males developed an arthritis and 4 per cent of these had an associated tenovaginitis. Standberg further states that of 81 cases of gonococcal tenosynovitis 7 occurred in the tendon sheaths of the palm and wrist. These figures indicate that this type of gonorrhœal tenosynovitis occurs about once in every 7,000 cases of gonorrhœa in males. Since the lesion occurs but infrequently in the absence of an arthritis, this case report deals with one of the most rarely diagnosed extra-genital gonococcal infections. Although a review of the modern literature reveals no case reports upon this subject, we believe that the rarity of the lesion is more apparent than real and that many cases occur, some of which are undiagnosed and the remainder not reported.

CASE REPORT

A.M., male, aged 29, was admitted on February 15, 1933, and discharged on March 29, 1933. The patient was an adult white male who, six days previous to admission, developed an acute gonorrhœal urethritis for which he was receiving treatment at the out-patient clinic. The only history of injury which could be elicited was that two days before admission he had slipped and, to save himself from falling, grasped an iron bar with his right hand. At this time he had a slight pain in his right wrist and hand, but this discomfort was transitory and no disability was noted. Twenty-four hours later he first had pain over the head of the right fourth metacarpal bone. This pain gradually spread to the hypothenar region and then across to the thenar eminence.

Examination revealed the physical signs of an acute suppurative tenosynovitis involving the ulnar and radial bursæ. There was a marked swelling of the hand, wrist and lower forearm, and the red streakings of an acute lymphangitis extended up to the elbow. The regional lymph nodes were not enlarged. The temperature was 102° F.; pulse, 96; and leucocyte count, 11,000. The urine was negative, except for an occasional pus cell and the urethral smear was positive for the gonococcus.

From the examination and history a tentative diagnosis of acute gonococcal tenosynovitis was made. Because of the general reaction and the acute suppurative process local drainage was the treatment elected. The radial and ulnar bursæ were widely incised and at all points yellowish-brown odourless pus was obtained. An incision entering the mid-palmar space did not expose pus. There was a marked œdema of the tendon sheaths and contiguous tissues. The tendons were of normal size and colour, and appeared to be covered by a smooth glistening membrane.

Swabs taken from the radial and ulnar bursæ and the mid-palmar space were planted in nutrient broth and on blood agar plates. Direct smears were made and stained by Gram's method. Smears from the mid-palmar space showed no pus cells or bacteria, and cultures were sterile after one week. Smears from the radial and ulnar bursæ, though containing fewer pus cells than usually found in gonorrhœal suppurative lesions, showed many Gram-negative intracellular diplococci which were morphologically similar to the gonococcus.

After twenty-four hours' incubation the broth was cloudy and the colonies on blood agar were moist and transparent and of moderate size. Smears from these colonies and the nutrient broth showed a pure culture of Gram-negative diplococci with the usual morphological variations seen in the artificially grown gonococcus. Transfers of the primary cultures did not grow on plain agar, but a good growth was obtained on media enriched with blood or serum. In serum sugars dextrose was fermented, while maltose and saccharose were not. We were fortunate in securing a good growth in artificial media. It is apparent that the organism was in an actively growing phase, which made it readily adaptable to artificial cultivation, and that in the primary growth in nutrient broth sufficient serum was present on the swab to fulfil the nutritive requirements of the organism. Swabs taken three days after the operation again demonstrated the presence of the gonococcus with its typical morphological and cultural characteristics. Blood cultures taken at the time of operation, one, and three days later, were negative.

The patient was placed upon the routine treatment accorded cases of suppurative tenosynovitis, and made an uneventful recovery. When examined one year after discharge the anatomical findings were as follows. The incisions had all healed well, leaving firm scars in the palm. The wrist joint was normal in all respects. The thumb showed fusion of the interphalangeal joint and fixation of the metacarpo-phalangeal joint in slight flexion (Fig. 1). There was no evidence of action of the flexor pollicis longus tendons. The index, middle and ring fingers moved through a full range without discomfort, and their grip was strong. In the little finger there was some limitation of extension of the proximal and distal interphalangeal joints, but flexion was unimpaired (Fig. 2). There were no sensory changes over any of the digital nerves of the hand.

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DISCUSSION

A case of gonorrhœal tenosynovitis, which occurred six days after the first appearance of an acute gonorrhœal urethritis, has been presented. We believe that at the time of his slight hand injury the man was also suffering from a gonococcal bacteriæmia. Trauma produced a *locus minoris resistentiæ*, with localization of the organism at that point. We were fortunate in securing a primary growth of the bacteria, and believe that although this type of tenosynovitis is admittedly rare it occurs with a greater frequency than is generally recognized. Though the probability of the organism being the gonococcus was recognized before operation, the presence of a frank suppurative tenosynovitis determined the course of treatment. While a gonorrhœal infection of the tendon sheaths may occur without suppuration and, as such, may be treated conservatively, we believe that, in accord with the teaching of Kanavel, the presence of pus, as in the case of joint involvement, justifies incision and drainage. The anatomical result of this method of treatment was good and the patient now suffers but little disability.

SUMMARY

A case of acute suppurative gonococcal tenosynovitis is described. A minimal trauma to the hand and wrist, in the presence of a gonococcal bacteriæmia, determined the point of localization of the bacteria. The diagnostic features, method of treatment, and result obtained are noted.

FIG. 1.—Fixation of metacarpophalangeal joint of thumb in slight flexion.

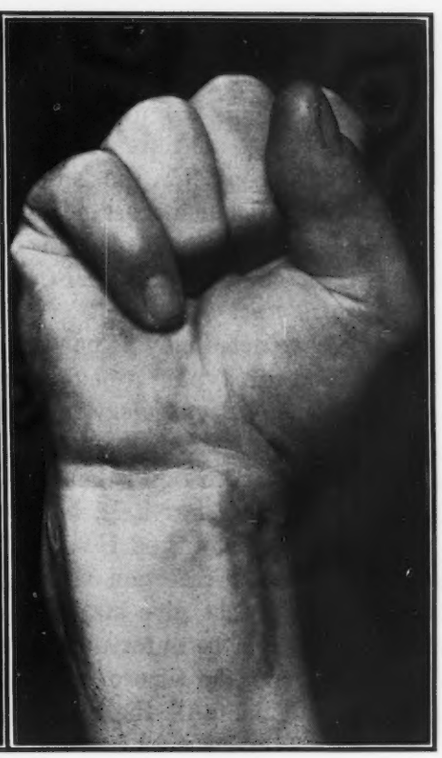

FIG. 2.—Flexion of the interphalangeal joints is unimpaired.

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OTITIS MEDIA AND MASTOIDITIS DUE TO PNEUMOCOCCUS TYPE III

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INFECTION of the middle ear and mastoid cells with type III pneumococcus appears to be definitely increasing in frequency, and it is for this reason that I am reporting our experiences with it for the past year. Many of the older text books devote only a few lines to this type of ear infection, but all refer to it as infrequent though very severe. In the European literature it has received much more attention, and for years has had a prominent place in their teaching, being referred to as due to *Streptococcus mucosus capsulatus.*

The increase we have noted may be partly due to an easier method of typing pneumococci. Since our Department of Bacteriology has been using the Neufield method the diagnoses of the special types have been more rapid than in the past. Statistics from other hospitals, however, also show that pneumococcus type III is more frequently a cause of ear infection than was formerly thought. I cannot give statistics on all our cases of otitis, because unfortunately we did not take a culture at the time of myringotomy on all our patients. All the cases that came to mastoid operation, however, had cultures taken. In the year 1934 there were 55 simple mastoid operations, and of these, 10, or 18.2 per cent, were due to pneumococcus type III. It has been our experience, and also the experience of other clinics, that this type of infection is much more frequent in adults than in children. There was only one child in our series of ten cases.

Pneumococcus type III is described as being relatively non-virulent in the Eustachian tube, mildly virulent in the middle ear, and intensely virulent in the mastoid. Clinically, it is described as running a very typical course, and I do not think it would be out of place to review its more important clinical features.

Insidious course and onset.—There may or may not be an acute stage. Many patients merely complain of a sense of fullness and deafness on the affected side, and may not consult a physician for a week or so. This condition may persist for even several months before complications set in.

The appearance of the drum.—If there is an acute stage the drum will show redness and bulging, but if there is no acute stage, the drum shows a condition resembling subacute middle ear catarrh. In any case the acute stage passes rapidly into the latent stage, in which the drum may possibly heal and only show loss of landmarks and lustre, or there may be a small perforation with mucoid discharge. On myringotomy the drum is found to be thickened and infiltrated.

The discharge.—Discharge may be thin and serous if myringotomy is performed in the acute stage, but soon assumes its typical mucoid character.

The temperature.—Except in the acute stage, these cases are essentially afebrile. An elevation of temperature above 100° during the course of the disease usually means intercurrent infection or a complication.

Pain and mastoid tenderness. — These two symptoms are, as a rule, conspicuous by their absence. Patients, as a rule, complain of a sense of fullness or numbness on the affected side.

Hearing.—Deafness is a very definite symptom. It is usually persistent, and in these cases, as in any middle ear infection, is a good indication as to the progress of the disease.

X-ray examination. — This usually shows cloudiness of the mastoid early in the disease.

Appearance of the mastoid at operation.—Mastoid involvement is always much more extensive than one would expect from the character of the disease. It presents a rather gelatinous appearance, as if the whole bony structure were softened. Pus formation comes on rather late.

Slow convalescence following operation. — Pneumococcus type III is very resistant to the usual antiseptics used in post-operative mastoid treatment. If repeated bacteriological examinations are carried out the organisms will be found for weeks, and possibly months, after operation.

These are the usual typical clinical findings, but all cases do not conform to this clinical picture, and I cannot stress too strongly the value of cultures from the middle ear at the time of myringotomy.

I will attempt to illustrate these points by the cases we treated during 1934.

CASE 1

B.B., male, first seen on January 6, 1934, with history of deafness in the right ear for two weeks, and discharge for five days. No culture was taken.

January 16th, admitted to hospital. A skiagram was suggestive of breaking down of the cell walls. Leucocyte count, 15,000.

January 17th, simple mastoidectomy. A culture taken at the time of the operation showed pneumococcus type III.

January 31st, discharged from hospital; ear drum and wound healed, but hearing not back to normal.

March 4th, the patient was readmitted with a return of the ear symptoms, and right-sided facial paralysis.

March 5th, the mastoid was explored. No cells were found, but the cavity was filled with necrotic tissue instead of healthy granulations. Cultures showed pneumococcus type III still present in the mastoid. The facial paralysis showed definite improvement following operation.

March 18th, the face was almost normal, but the patient began to show signs of labyrinthine involvement.

March 20th, right radical mastoidectomy, with return of facial paralysis.

This is a fairly typical example of pneumococcus type III otitis and mastoiditis. The patient did not complain of pain, but rather of a sense of fullness on affected side. In spite of the mastoidectomy the infection remained in the mastoid and did not show its presence by discharge from the middle ear or mastoid. This condition persisted for over a month. The fact that the hearing remained poor should have been a warning that trouble was still present, and these patients should be kept under observation until it is certain that there is no further trouble in the mastoid.

CASE 2

P.C., male, admitted to the Medical Ward on April 1, 1934, with diabetes. During his first two weeks in hospital he complained of slight deafness and buzzing in the left ear.

April 16th, the left ear started to discharge spontaneously. A culture taken from the discharge showed pneumococcus type III. Leucocyte count, 8,000. A skiagram showed mastoid involvement.

April 28th, simple mastoidectomy. The wound was left wide open. A culture taken at the time of operation showed pneumococcus type III.

June 11th, discharged from hospital. The mastoid wound was still discharging slightly, but the discharge was not cultured. The patient attended the Out-Patient Department rather irregularly following discharge from the ward.

June 20th, readmitted with a diagnosis of meningitis, and died on the following day. Culture from the cerebrospinal fluid showed pneumococcus type III.

Here we have a period of almost three months before complications set in. We also have a mastoid which was apparently draining satisfactorily causing a fatal intracranial complication. Post-operative cultures should have been taken and the patient kept in hospital until the discharge was free from pneumococci.

CASE 3

Mrs. I.M. This patient attended the Oto-Laryngology Clinic at the Western Division of Montreal General Hospital on April 19, 1934, complaining of pain and deafness in the left ear. The history as to duration of symptoms was indefinite.

Examination.—A slight mucoid discharge from left ear and slight mastoid tenderness. Temperature 100°; pulse 128. The perforation was enlarged, but a culture was not taken. The patient attended clinic rather irregularly, but her condition seemed to be improving satisfactorily, except that she was still quite deaf.

May 23rd, complained of severe temporal headaches. Temperature 100.4°; pulse 72. She was admitted to hospital with a diagnosis of meningitis.

May 26th, died. Autopsy revealed a pneumococcus type III meningitis, with a similar growth on culture made from the mastoid. The middle ear showed no obvious exudate and the ossicles were normal. There was, however, necrosis of the mastoid tegmen and also of the bone surrounding the inner ear, with pus in the internal auditory meatus. This is a rather shorter history than usual, but we do not know definitely how long she had symptoms before attending the clinic.

It is doubtful in this case if a culture would have shown the presence of pneumococcus type III, as these organisms tend to disappear from the middle ear very quickly after myringotomy or spontaneous perforation. This, however, is not proof that they have disappeared from the mastoid.

CASE 4

N.B., male. Three weeks before admission (June 5, 1934) earache developed on the left side. One week before admission the left ear started to discharge. He had had deafness in the left ear since the onset of pain, and in the right ear for the previous week or so. On admission he was also complaining of headache, tinnitus and slight vertigo.

There was moderate purulent discharge from left ear. The right ear drum was reddened and bulging slightly posteriorly. The temperature on admission was 100°. A right myringotomy was performed, and the perforation in the left ear drum was enlarged. Culture from the left ear showed staphylococcus; no growth from the right ear. X-ray examination showed mastoid involvement on both sides, with signs of cell-wall destruction on the left. Leucocyte count, 6,000.

June 7th, left simple mastoidectomy. There was extensive involvement of the mastoid, with pus in the antrum and tip regions. Culture showed pneumococcus type III.

June 9th, right simple mastoidectomy. Culture showed pneumococcus type III.

June 16th, right jugular ligation. The patient had been running a septic temperature for the previous four or five days.

June 20th, died. Autopsy revealed pneumococcus type III meningitis, and right lateral sinus thrombosis.

Cultures taken in this case did not help, as the left ear had been discharging too long to get a reliable result. I cannot explain why there was no growth from right ear at the time of myringotomy, unless the culture was allowed to dry before being plated. I think the result here was unavoidable, as the case was well advanced before the patient came to treatment.

There were six other cases, which ran long but uneventful courses and recovered without any complications.

To quote from other writers: Dean,[1] of St. Louis, says, "In every case in which this organism has been found it has been necessary, sooner or later, to do a mastoid operation. This, of course, does not mean that we should operate as soon as we find pneumococcus type III in the ear discharge, but rather, we should let the clinical course—blood count, x-ray, etc., guide us as to when operation should be performed." Kopetsky,[2] says, "Among the special clinical types of acute otitic infections none play a more important rôle than those caused by *Streptococcus mucosus capsulatus* (pneumococcus type III)." He stresses the fact that the finding of pneumococcus type III on myringotomy is not an indication for immediate operation. He states that many cases of mucosus otitis have cleared up without mastoidectomy, and that too early operation tends to spread the infection endocranially. According to other observers, 80 per cent of these cases require a mastoid operation, compared to 35 to 40 per cent of cases of ordinary streptococcal infection. Page,[3] gives a much more favourable prognosis. He reviews a series of 300 cases of otitis that came to myringotomy. Of these 17 per cent showed pneumococcus type III; thirty-five cases were followed; 6, or 17.1 per cent, had a mastoid operation; 29 recovered without operation. There were no deaths.

The results in our small series of 10 cases unfortunately cannot be compared with those published by Page. Our records show that 2 died from meningitis; 1 died from meningitis and lateral sinus thrombosis; 1 developed facial paralysis; 6 made uneventful recoveries.

There were 5 deaths in 1934, due to acute or chronic ear infection, and of these, 3 were due to pneumococcus type III. All cases in which pneumococcus type III was found on myringotomy eventually had to have a mastoid operation. The condition of the patient's hearing and repeated x-ray examination of the mastoid played a large part in deciding when operation should be performed.

These cases have taught us certain definite principles as to treatment. (1) In every acute otitis a culture should be taken at the time of myringotomy. (2) If pneumococcus type III is found in the culture, the following precautions should be taken.

Watch the clinical signs carefully. Every case of pneumococcus type III otitis is a potential mastoid case.

Examine the mastoid early by x-ray, regardless of the clinical appearance, and repeat this examination frequently. A skiagram taken on the first or second day of disease, even if it does not reveal much disease, will be useful for comparison with subsequent films.

At operation leave the wound wide open, and keep it open until no pneumococcus type III is found on bacteriological examination. Thoroughness in operation is very important, as simple mastoid drainage is no guarantee against intracranial complications.

Since we have been getting a rapid bacteriological diagnosis on myringotomy, and treating these cases accordingly, our results have been much better. A short description of the routine method of bacteriological examination of exudates from the middle ear and mastoid as employed in our Department of Bacteriology, might be of interest.

Some of the exudate on a swab, or, better still, in a culture tube, is sent to the laboratory as soon as possible. A sample of the material is examined at once for pneumococci. If this organism be present the type can be determined at once by the Neufield method. The technique of performing the test is simple and the interpretation of the reactions easy. Besides the above method of identification, cultures are made in all cases upon blood agar, and a white mouse is injected intraperitoneally with some of the material. If the organism has the morphology and staining reaction of the pneumococcus group, it is further identified by its reactions on sugar serum water, including inulin, and its solubility in bile. It is then grouped by its precipitation and agglutination reaction. In the experience of our laboratory, the presence of pneumococcus types I, II, and III, as determined by the Neufield method properly performed, will always be corroborated by the

longer and more complete bacteriological methods of study, its reaction in various media, and its precipitation and agglutination reactions. Some work under way in the laboratory will, we hope, make the exact diagnosis of group III pneumococcus at the time of operation even more important than it is now.

NOTE: Since preparing this article the following very interesting publication has appeared in the *Archives of Otolaryngology*, 1935, **21:** 154, "Prophylactic vaccination against intracranial complications following pneumococcus type III mastoiditis," by Joseph L. Goldman, M.D., Gregory Schwartzman, M.D. and Cecele Herschberger, B.S.

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SERUM PHOSPHATASE IN TOXIC AND HÆMOLYTIC JAUNDICE

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EXPERIMENTAL obstruction of the common bile duct in dogs has been shown to result in a marked increase in serum phosphatase, (Armstrong, King and Harris[1]), the value reaching some one hundred times the initial amount in 4 to 6 days. The rise in clinical cases of obstructive jaundice was also shown to be very marked, although never as great as in the dogs. The clinical observations confirmed the work of Roberts,[2] and both clinical and experimental records confirm the contention that obstructive jaundice is characterized by a very high serum phosphatase. The present report is concerned with the serum phosphatase in animals suffering from experimentally produced toxic and hæmolytic jaundice.

The estimation of the phosphatase activity of serum was carried out by the method described by King and Armstrong,[3] and is expressed as units per 100 c.c. of serum. Plasma has been used for the determination in the hæmolytic experiments so that blood counts and hæmoglobin estimations could be made on the same sample.

TOXIC JAUNDICE

Toxic damage to the liver was produced by three reagents, *viz.*, chloroform, phosphorus and toluylenediamine. The histology of the liver following administration of these chemicals to dogs is well known. Chloroform is a particularly valuable reagent, since, histologically, no desquamated material is found in the bile canaliculi, and thus it cannot be argued that a partial obstruction to the bile flow has been present.[4] Both chloroform and toluylenediamine[5] produce some hæmolysis of red blood cells in addition to their toxic action, but this effect is not marked.

Eight experiments were carried out altogether: four with chloroform; three with phosphorus; and one with toluylenediamine. The following three protocols give the data of representative experiments.

HÆMOLYTIC JAUNDICE

It was pointed out in a former paper[1] that it is very difficult to produce in dogs a visible hæmolytic jaundice comparable with clinical hæmolytic jaundice in human beings. Two procedures were discussed, viz., withdrawal of blood from the animal and reinjection after hæmolyzing and filtering the blood; and injection of sodium oleate intravenously. It was possible by these means to cause a transient yellow coloration of the serum, but no pigmentation of mucous membrane, skin or fat depots was apparent. Thus the animals were considered to have had *latent* hæmolytic jaundice. When the sera of these animals were tested no very definite increase in the phosphatase activity was detected. A single further attempt to produce sufficient hæmolysis with sodium oleate to give rise to frank jaundice proved futile, as did also attempts with snake venom and lysolecithin. Hence a more powerful hæmolytic agent was sought, and phenylhydrazine hydrochloride was finally selected. This substance is said to give

TABLE I. LARGE MONGREL POLICE DOG; WEIGHT 13 KILOS

Day	*Treatment*	*Serum phosphatase*	*Serum v. d. B.*	*Bilirubin in urine*	*Notes*
			Dir./Ind.		
0	Induced by ether, 1 hr. chloroform by inhalation	3.4	−/−		Quick recovery from anæsthetic.
1	−	74.0	+/0.7		Well.
2	−	133.0	+/		Well.
3	−	96.0	+/		Well.
4	Induced with ether, 1 hr. chloroform by inhalation	81.0	+/	strongly+	Well.
5	−	116.0	+/2.8		Sneezing attacks.
6		164.0	+/1.4	+	Vomited.
7	−	115.0	+/1.4		Not acutely ill.
8	Induced with ether, 1 hr. chloroform by inhalation	97.0	+/0.6	strongly+	
9	−	124.0	+/0.9		
10		135.0	+/2.5	strongly+	Seems ill. Faint icterus in scleræ.
11	Induced with ether, 2 hrs. chloroform by inhalation	145.0	+/1.3	very strongly+	Not acutely ill.
12	−	132.0	+/1.1		Well.
13	−	130.0	+/1.7		Well.
14	−	115.0	+/1.0	very strongly+	Well.
15	−	102.0	+/0.5	very strongly+	Well. No icterus.
17	−	82.0	+/0.4		Quite well.
19		61.0	+/	+	Quite well.
21		42.0	−/−	+	Quite well.
24		28.0	−/−	trace	Quite well.
26		24.2	−/−		Quite well.
28		22.0	−/−		Quite well.

TABLE II. LARGE BROWN MONGREL POLICE DOG; WEIGHT 15 KILOS

Had previously been used for brief obstruction experiment, during which the serum phosphatase had reached 107 units and had returned to normal. At no time had the animal been definitely ill.

Day	*Treatment*	*Serum phosphatase*	*Serum v. d. B.*	*Bilirubin in urine*	*Notes*
			Dir./Ind.		
0	25 c.c. 1% phosphorus in olive oil by stomach tube	5.1	−/−		Vomited all food.
1	25 c.c. 1% phosphorus in olive oil by stomach tube	3.0	−/−		Vomited. Not acutely ill.
2	−	3.2	−/−	trace	Vomited. Not acutely ill.
3		17.0	−/−	−	
5		30.0	+/2.2	bile-stained	Refusing food.
6		23.7	+/6.5	very strongly+	Acutely ill. Refusing food. Deeply jaundiced.
7		25.0	+/5.8	very strongly+	Acutely ill. Refusing food. Deeply jaundiced.
8		80.0	+/7.2	very strongly+	Improved general condition. Eating. Less jaundiced.
9		81.0	+/3.6	very strongly+	Much better. Icterus fading.
10		61.0	+/2.9	+	Quite well. Slight icterus.
12		48.0	+/1.4	strongly+	Icterus just visible.
13		35.0	+/1.0		Quite well.
15		25.6	+/0.7		Quite well.
19		14.3	−/−		Quite well.
21		13.5	+tr/		Quite well.
22		11.5	tr/		Quite well.
23		10.4	/tr		Quite well.

rise to slight liver damage, but if there is any such effect it is very subsidiary to its hæmolytic action.

Ten c.c. of 0.5 per cent phenylhydrazine hydrochloride solution were given daily by stomach tube to 2 dogs weighing 5 and 7 kg. respectively. Marked hæmolysis occurred, and a very pronounced drop in the red blood count and hæmoglobin took place. Unfortunately, even with this reagent no visible jaundice was ever observed. The serum, however, became noticeably yellow and gave some colour with the diazo reagent after the addition of alcohol. The urine became deeply pigmented, some of

TABLE III. TOLUYLENEDIAMINE POISONING; MONGREL COLLIE-TERRIER; WEIGHT 10 KILOS

Day	*Treatment*	*Serum phosphatase*	*Serum v. d. B.*	*Bilirubin in urine*	*Notes*
			Dir./Ind.		
0	12 c.c. 1% toluylene-diamine by stomach tube	5.0	−/−		
1	" "	3.6	−/−		Quite well.
2	" "	3.1	−/−	−	Quite well.
4		16.4	−/−		Quite well.
5		16.2	−/−	−	Quite well.
6		11.7	−/−		Quite well.
7		9.4	−/−	−	Quite well.
9		7.9	−/−	−	Quite well.
11		8.1	−/−		Quite well.
12	25 c.c. 1% toluylene-diamine by stomach tube				
13	" "	76.0	+/19.7	very strongly +	Well. Scleræ yellow.
14	" "	83.0	+/19.9		Less active. Very jaundiced. Hb. 63%. R. B. C., 6,500,000.
15		84.0	+/18		Very jaundiced. Hb. 63%. R.B.C., 6,060,000.
16		63.0	+/10.3	deeply pigmented	Definitely ill. Less jaundiced. Hb. 57%. R. B. C., 6,440,000.
18	60 c.c. 2% toluylene-diamine	46.0	+/4		Less jaundiced. Not eating. Acutely ill. Hb. 59%. R. B. C., 5,200,000.
19					Found dead.

TABLE IV. BULL TERRIER, MALE; WEIGHT 7 KILOS

Day	*Treatment*	*Plasma Phosphatase*	*Plasma v. d. B.*	*Bilirubin in Urine*	*Hb. per cent*	*Red blood cells*	*Notes*
			Dir./Ind.			(millions)	
0	10 c.c. 0.5% phenyl-hydrazine by stomach tube	3.5					
1	" "	4.4	−/−		66	7.02	Quite well.
2	" "	4.1	tr/−		59	6.75	Quite well.
3	" "	4.3	−/tr.		61	6.85	Quite well.
4		4.4	−/tr.		53	5.8	Quite well.
6	" "	3.4	−/tr.		60	4.58	Quite well.
7		3.5	−/0.5	very pigmented; strongly +	38	3.64	Not eating; lassitude.
8					37	4.06	Not eating; lassitude.
9		4.0	−/tr.		34	3.07	Not eating; lassitude.
10		4.2	−/tr.	very strongly +	31	2.73	Rapid heart rate. Increased resp. rate.

this pigment being bilirubin. No significant changes in phosphatase occurred.

The accompanying protocol contains the details of one such experiment (Table IV).

DISCUSSION

When a liver poison is administered to a dog a definite increase in the activity of the serum phosphatase takes place concomitantly with the other early signs of liver impairment (usually bilirubinuria, less frequently, a positive serum van den Bergh reaction). Such signs occur long before any clinical evidence appears. Broadly speaking, the increase in the activity of the phosphatase is, like the van den Bergh reaction, proportional to the degree of liver damage. If much of the hepatic tissue has been destroyed the phosphatase value reaches a high level, but in our series, even although the dose of the poison was sometimes sufficient to result in death of the animal, values *above* 200 units per 100 c.c. did *not* occur. When recovery takes place the phosphatase value slowly approaches normal, this being frequently the last sign to disappear.

Bile pigment before its excretion is normally confined to the circulating blood. Only when the amount in it becomes markedly increased does the pigment escape from the blood into the tissues. Whether or not a sufficient increase of the pigment can be brought about to produce jaundice depends upon the rate of formation of the pigment and the rate of its excretion by the liver and the kidney. The dog's kidney excretes bilirubin with great ease, so easily indeed that when the liver is healthy a very drastic hæmolysis must be brought about before any increase in bilirubin at all can be detected in the serum. In our experiments we were unable to cause a sufficient increase in serum bilirubin to lead to visible jaundice, although as judged by the urinary output of the pigment there was a very pronounced increase in its formation. A comparable increase in bilirubin formation in a human being, in whom the renal excretion is slow, would undoubtedly cause icterus. As the dog's kidney does not apparently excrete phosphatase, the results indicate that if hæmolytic jaundice could be produced in this animal there would be no accompanying increase in serum phosphatase. Such a deduction presumes, of course, that bilirubin itself is not a precursor of phosphatase, which is extremely unlikely.

It was shown[1] that when the common bile ducts of dogs had been obstructed, after 4 days all animals had in the serum more than 200 units of phosphatase per 100 c.c., and between 500 and 600 after 1 week. This is in contrast to the findings in toxic and hæmolytic jaundice just described. Preliminary observations on human cases indicate that in toxic jaundice the highest phosphatase values which occur are much lower than those reported for the dog; and certainly, the values in obstructive jaundice are much lower than those recorded for biliary obstruction in dogs.

The experiments require to be supplemented by a large number of observations on human cases of jaundice before a definite conclusion can be reached as to the value of the phosphatase test in the differential diagnosis of the various types of this disease. The results do, however, suggest that under certain circumstances the test would prove useful. For example, if, for human beings the maximum height to which serum phosphatase can rise in toxic jaundice be known, it might then be possible to differentiate between jaundice of complete biliary obstruction, toxic jaundice and hæmolytic jaundice, by examining the serum for two or three days. Although it would be extremely difficult to differentiate by means of phosphatase estimations between a jaundice due to mild intermittent obstruction of bile flow and a severe toxic jaundice, we are inclined to agree with the suggestion of Roberts[2] that, taken in conjunction with clinical and other laboratory findings, the estimation of serum phosphatase may prove of value in the differentiation of the several types of jaundice.

SUMMARY

1. Toxic jaundice has been produced in 8 dogs. In all animals the serum phosphatase rose from an initial value of about 10 units to a value not exceeding 200 units.

2. Marked hæmolysis of red cells was produced with phenylhydrazine hydrochloride in 2 dogs. The serum gave a definite indirect van den Bergh reaction, and the urine contained bilirubin, but no rise in plasma phosphatase occurred.

3. These findings are contrasted with those previously reported for obstructive jaundice, and on the basis of a limited number of experi-

ments it is suggested that the phosphatase test may, with further investigation, become useful as a means of aiding differential diagnosis of the several types of jaundice.

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CANCER OF THE BREAST*

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THERE is, perhaps, no organ in the body which has afforded a greater opportunity to study pre-cancerous states than has the mammary gland. The removal of this organ for various pathological conditions that precede cancer has supplied important data which have given us an opportunity to study its pathology in great detail. The technique of cutting whole serial sections by the giant microtome, as first introduced by Sir George Lenthal Cheatle, of London, has further enhanced our knowledge of breast pathology, particularly because this method enables us to study the topographical distribution of disease in a way which the small section method does not allow.

The intimate physiological relationship between the mammary gland and the ovaries, and indirectly with other glands of internal secretion, permits us to observe the physiological activity of this organ. The changes which the epithelium and connective tissue of the breast undergo at birth, puberty, menstruation, pregnancy, lactation, and the menopause have been accurately observed, and form the basis of further investigations into disturbances of function that may be important in relation to certain pathological states. Rapid and significant advances in the studies of hormones and the actual isolation of certain hormones in recent years have opened an important field for experimental investigation upon problems relating to abnormalities in the breast, particularly the formation of tumours.

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PATHOLOGICAL CONSIDERATIONS

Normal physiological activity of the mammary gland leads to a simple hyperplasia of the epithelium lining the ducts and acini. The newly-formed cells fail to survive, desquamate, and form débris which is absorbed or accumulates in the duct system of the breast. This epithelial change is accompanied by a hyperplasia of the pericanalicular and periacinous connective tissue and an accumulation of lymphocytes. The microscopic appearance thus created has given rise to the designation "chronic mastitis". Since it is now clearly understood that the presence of lymphocytes is not necessarily an indication of inflammation, and since these clinical and microscopical phenomena are directly related to physiological activity, we contend that the state is a physiological one and not one due to inflammation. For these reasons Cheatle has suggested the term "mazoplasia" to emphasize the physiological character of this condition. The use of the term "chronic mastitis" under these circumstances should be avoided, not only because it is not a true description of the lesion but, more particularly, because of the vagueness of the term. As it is generally used in the literature the term includes not only the innocent physiological state which we have called mazoplasia, but also the more serious conditions—microscopic cysts and papillomata. The inclusion of such innocent and purely physiological states as mazoplasia with such dangerous lesions as Schimmelbusch's disease under one term has led to a great state of confusion, especially upon the question of the

relationship between so-called "chronic mastitis" and cancer. If by "chronic mastitis" one refers to "mazoplasia", our evidence fails to show any relationship between the two states. If, on the other hand, one includes Schimmelbusch's disease under the term, the problem is different.

A mass of clinical, pathological, and experimental data has accumulated which clearly indicates that cancer in general and cancer of the breast in particular are not sudden events or accidents in previously normal tissues. On the contrary, it would seem that cancer as a rule is the end-result of a series of changes which may have begun many years before. In the breast it has been possible to demonstrate a series of interrelated and consecutive tissue changes which progress slowly over a period of many years. Our evidence leads us to the opinion that mazoplasia is not a step in this pathological process, and that the first microscopical evidence of the changes which ultimately lead to cancer is the formation of microscopical cysts. The epithelial hyperplasia which leads to cyst formation may stop, and the breast may remain purely cystic throughout the life of the individual, but in a considerable proportion the hyperplasia continues and sooner or later becomes complicated by the advent of the neoplastic process or the formation of papillomata. The combination of cysts and papillomata gives rise to a condition known as Schimmelbusch's disease. Again, a breast which is the seat of Schimmelbusch's disease may remain so throughout the lifetime of the individual, but in a considerable proportion of cases the epithelial change progresses, and at some point in this process epithelial cells invade outside boundaries and cancer is established.

The evidence which we have accumulated leads us to believe that cysts and papillomata are pre-cancerous or potentially cancerous states. By these terms we imply that if the epithelial changes associated with these conditions progress cancer is the inevitable consequence. We fully recognize, however, and admit that the epithelial changes may regress at any point and disappear, or that they may be arrested and remain stationary throughout the lifetime of the individual, but we insist that if they progress carcinoma is finally established. By the designation "pre-cancerous" we do not mean that they inevitably become cancerous, but that they are potentially cancerous. It is also important to emphasize at this point that the events which have been described may occur with varying degrees of rapidity. We know that many of these changes require as long as thirty or even forty years to develop. At the other extreme, however, the process may be very rapid; in fact, it may be so rapid as to end in cancer without leaving any discernible trace of the previous stages through which it has passed. In the latter examples we cannot be absolutely certain whether cancer has arisen by this process or by another unknown method.

Cystic disease of the breast is usually diffuse and often bilateral. These facts were especially emphasized by Reclus, and the condition is now usually designated as Reclus' disease. In many instances one cyst outgrows its neighbours and reaches a sufficient size to be clinically palpable. In these larger cysts the epithelium is usually so degenerated as to fail to respond to stimuli, and for this reason cancer rarely complicates the larger cysts. When cancer is discovered in the wall of a cyst it has usually originated in the active epithelium of a duct which enters it and not in the degenerated epithelium which lines the cyst.

It is in general not fully appreciated that when a cyst is clinically palpable as a single lesion it is almost invariably surrounded by numerous smaller cysts that are too small to be palpable. It should be noted also that microscopical cysts are potentially more dangerous than the large, palpable cysts. The common error that is committed in an effort to practise conservatism is to perform a limited excision of the palpable cyst which is innocent, and not remove the surrounding smaller cysts which are more likely to be complicated by the cancerous process. In the treatment of cystic disease of the breast excision of the affected segment rather than local excision of the palpable cyst should be practised.

CLINICAL CONSIDERATIONS

The well known tendency of cancer of the breast to disseminate early and widely renders this disease one of the most malignant of all the types of cancer with which we are familiar. Pending the acquisition of a more intimate knowledge concerning the etiological factors in the origin of mammary cancer, the most important

practical problem that confronts us is the question of early diagnosis. It is an unfortunate circumstance that cancer of the breast in its early stages is an entirely painless disease. In fact, it is well known that mammary cancer may proceed through a considerable part of its natural course and reach an advanced stage without causing pain. In my experience it is because of this fact that most women fail to consult their physicians in the early stage of the disease. The medical profession teaches the laity to consult a physician the moment a palpable tumour appears in the breast. But actually, once a tumour is palpable by the patient, the disease has already reached an advanced stage. Efforts to circumvent this difficulty have led in the direction of suggesting periodic examinations, but this problem is complicated as it raises the question of how often a patient should be examined and even though a patient be examined twice annually, a cancer of the breast may have existed for four or five months before a subsequent examination. Perhaps the most fruitful field in the prevention of mammary cancer lies in the recognition, proper interpretation, and treatment of the pre-cancerous states, and immediately I refer to such conditions as papillomata, Schimmelbusch's disease, and Paget's disease of the nipple.

Pain.—With the rarest exceptions pain is not a sign of early cancer, but accompanies this condition only in the last stages of the disease. In isolated examples sharp, localized, persistent pain constitutes a symptom of beginning cancer of the breast. The most common type complained of is that which accompanies the menstrual periods. Under these circumstances the pain is diffuse, bilateral, precedes the period, and is usually relieved with the onset of the period. I have found that many patients suffering from this type of pain have a short and scant menstrual period, and that the administration of ovarian residue, either by mouth, or preferably by the hypodermic method, relieves the pain in many instances. There can be little doubt that psychological factors play a prominent rôle in the extent to which women complain of painful breasts.

Discharge from the nipple.—There has been much controversy regarding the interpretation and treatment of discharge from the nipple. A clear, straw-coloured discharge from one nipple, or from both nipples, which does not contain red blood cells on microscopic examination, usually indicates the existence of an epithelial hyperplasia in dilated ducts and cysts. Breasts which exhibit these signs should be carefully observed. Surgical interference is contra-indicated, because it is impossible to localize the lesion and because in many instances the relation of this state to cancer is remote. In several cases that I have observed recently I have treated one or both breasts with interstitial radiation by means of removable platinum radium needles. The discharge in all the cases that I have treated has ceased. This method appears to me a logical procedure in the treatment of lesions that are diffuse, in which cancer does not yet exist, and in which the relation to cancer is rather remote.

A spontaneous, hæmorrhagic discharge from the nipple indicates a more serious condition. This sign is due either to a single papilloma or multiple papillomata, or may be due to beginning duct carcinoma. In the absence of a palpable tumour the possibility of the presence of duct carcinoma is remote, although I have observed one example in which this sign, unaccompanied by a palpable tumour, was caused by a microscopical duct carcinoma. In the presence of a palpable tumour surgical interference becomes clearly indicated. If no tumour can be palpated, transillumination of the breast frequently permits localization of the underlying lesion. When the papillomata are of microscopical dimensions transillumination fails to disclose them. The treatment of a breast which is the seat of a hæmorrhagic discharge from the nipple and in which no tumour can be felt constitutes a difficult and perplexing problem. The choice of treatment depends upon numerous circumstances, the age of the patient being one important factor. In several examples of this type in which the patients have refused surgical interference I have performed interstitial radiation of the breast. This procedure has resulted in a fibrosis of the lesion and a cessation of the bleeding, and I regard it as a useful procedure in selected cases.

Palpable tumours. — There is a tremendous variation in the consistency of normal breasts, and the same breast usually undergoes marked changes during various stages of the menstrual cycle. The interpretation of "lumps" in the breast and areas of localized nodularity is in-

deed a difficult matter. The most important aid in the interpretation of a suspected "lump" or nodularity is to determine by very careful palpation in a sitting and lying position the condition of the remainder of the breast, and also the condition of the opposite breast. Only in this manner can one establish the consistency of the remainder of the mammary tissues, and these findings constitute an important control in the patient who is being examined. The most important finding in a suspected "lump" is the presence of a localized nodularity in one breast which cannot be discovered in any other portion of the breast or in the opposite breast. Localization is the most important clinical finding in suspected lesions of the breast. The discovery, therefore, of several "lumps", or several nodularities, should immediately raise the suspicion that the condition is physiological rather than pathological, and that the condition is benign rather than malignant. It is for this reason that multiple masses in, or a multi-nodularity of, one or both breasts is usually the sign of a benign process. It is also of the greatest importance in examples in which the interpretation of the clinical findings is difficult to examine the patient at different stages of the menstrual cycle. By this procedure one frequently discovers that certain suspected nodularities have completely disappeared and the diagnosis at once becomes evident. The more common conditions which cause multi-nodularity are: (1) mazoplasia; (2) multiple fibroadenomata; (3) multiple cysts.

The most important sign of cancer of the breast is the presence of a single, discrete tumour, or a localized nodularity in one breast. The absence of skin adherence and retraction of the nipple cannot be considered as evidence that cancer does not exist. The safest attitude to adopt is to regard a single, localized tumour in one breast of a woman over twenty as cancer until proved otherwise.

Transillumination.—In 1929 the writer first described transillumination of the breast as an aid in differential diagnosis. Other observers who have utilized this procedure have generally agreed that it is a distinct aid in the interpretation of certain lesions of the breast. During the examination it is essential that the room be absolutely dark and that the transilluminating lamp be sufficiently powerful to penetrate the various lesions that we encounter in the mammary gland. I have found transillumination a distinct help in the interpretation of the following conditions: (1) in the differential diagnosis between cysts containing clear fluid and solid tumours; (2) in the diagnosis of hæmatoma of the breast following trauma; and (3) in the localization of duct-papillomata underlying hæmorrhagic discharges from the nipple. The procedure does not differentiate between a benign and malignant solid tumour such as fibroadenoma and carcinoma. A deep-seated cyst may exhibit all the classical signs of cancer, including adherence of the overlying skin and retraction of the nipple. If the cyst contains clear fluid it will transilluminate clear, and transillumination under these circumstances is a valuable aid in differentiating between the two conditions.

A trauma to the breast may cause interstitial hæmorrhage and a resulting hæmatoma. Frequently the mass that is thus formed exhibits skin adherence and presents the clinical picture of carcinoma. Indeed, the similarity to carcinoma is so striking that mastectomy has frequently been performed for this condition. Transillumination of a hæmatoma indicates a shadow that is caused by the blood pigment which has a specific appearance. The opacity is intense, irregular, and slowly fades toward the periphery. Based upon these findings alone I have withheld exploratory incision in a series of cases. Repeated transillumination under these circumstances shows a gradual diminution in the extent and intensity of the opacity and its final complete disappearance. It may require as long as three months for the shadow to disappear. These lesions are uncommon, but, when encountered, present a difficult clinical problem, in the solution of which I have found transillumination of considerable aid.

Transillumination is perhaps most useful in breasts which are the seat of a hæmorrhagic discharge from the nipple. In most cases transillumination discloses opacities which indicate the site and distribution of the underlying lesion. This finding in breasts in which no tumour can be palpated is of considerable help in deciding the therapeutic procedure to be adopted.

Biopsy.—The experience of most observers is that carefully performed incision or excision of suspicious lesions of the breast for microscopical examination does not prejudice the patient's

chance of cure. The indications for biopsy have naturally increased as an increasing number of patients consult their physicians soon after discovering an abnormality in the breast.

Under no circumstances is an exploratory operation justified unless facilities are available for the preparation and examination of a frozen section and for the radical surgical operation. In this connection I should like to emphasize the importance of regarding every localized tumour or nodularity with suspicion until proved innocent by microscopical examination. Few surgeons have escaped the embarrassment of regarding as benign a small, localized and encapsulated growth accompanied by none of the classical clinical signs of cancer only to find cancer on microscopic examination. In exploring suspicious areas in the breast the choice between incision and excision must vary under different circumstances. When the growth is very small, a wide local excision constitutes the method of choice; when the growth is large, incision, as a rule, is preferable. The exploratory incision should be made with due consideration to the subsequent incision for the radical operation.

THE SURGICAL REMOVAL OF THE BREAST

Although the surgical operation for removal of the cancerous breast is regarded as having been standardized, the differences in the execution of this procedure in the hands of different surgeons are remarkable. From time to time isolated attempts have been made to diminish the scope and extent of the radical operation for cancer, but few authorities upon the subject today are willing to admit the soundness of this tendency. There is little dissension from the view that the surgical procedure must be the radical operation as introduced and developed by Halstead, including the removal of a wide area of skin, the underlying breast, both pectoral muscles, fascia and the axillary contents. The skin incision must vary according to the location and size of the tumour. The extent of the skin to be removed has been a subject of some controversy. A recent and very comprehensive study of the problem by Lewis and Rienhoff led them to the conclusion that the incidence of recurrence was less and the survival longer in those cases in which a wide removal of skin was practised.

The advent of radiation as a post-operative measure in the treatment of mammary cancer has developed the tendency among some surgeons to diminish the extent of the surgical procedure, particularly as regards the skin. I believe that this is a dangerous position to adopt and that the extent of the surgical procedure should not be influenced by the fact that the patient is to receive prophylactic post-operative radiation. As the proportion of small, localized growths is on the increase, the problem of skin removal becomes less important, because in the treatment of small lesions adequate skin may be sacrificed and the defect closed after sufficient undermining of the flaps without tension and with no necessity for skin grafting.

Following the example of Sir Lenthal Cheatle, of London, I have practised the radical surgical operation for mammary cancer under chloroform anæsthesia administered in small quantities during a portion of the operation. The patient is anæsthetized with ethylene, and the administration of chloroform is begun just before the skin incision is made. Chloroform is administered for approximately thirty minutes during the first part of the operation, including the undermining of the skin flaps and detachment of the fascia from the chest wall. One to one and one-half ounces of chloroform are used during this period, and the administration of ethylene is resumed during the axillary dissection and closure of the skin. The marked diminution of bleeding consequent to lowering of the blood pressure is of much technical assistance. Sir Lenthal tells me that he has never had reason to regret the use of chloroform under these circumstances during the last forty years, and my relatively limited experience during the last seven years leads me to a similar opinion. The time of operation is shortened by at least forty-five minutes. The post-operative course, in my experience, has been much smoother and the period of recovery definitely shortened.

PRE-OPERATIVE AND POST-OPERATIVE RADIATION

What is the present status of our knowledge concerning the value of pre-operative and post-operative radiation in the treatment of mammary cancer? The demonstrated ability to control cancer of the breast by radiation alone, and the marked degenerative changes that can be induced in mammary cancer by radiation, as

indicated by microscopic studies of irradiated breasts, constitute the basis for the use of pre-operative and post-operative radiation.

The circumstances that appear to favour the use of pre-operative radiation are as follows: (1) the fact that surgery alone yields only 30 per cent five-year cures; (2) the probability that the mechanical trauma incident to the surgical procedure disseminates cancer emboli, and that this danger might be diminished by the use of pre-operative radiation; (3) the existence of a small but definite proportion of cancers of the breast which are radiosensitive, with the probability that these types are also highly malignant.

The objections to the use of pre-operative radiation can be summarized as follows: (1) the possible dangers of dissemination during the waiting period between the first radiation and the surgical removal of the breast; (2) the increase in difficulty of the surgical procedure and interference with post-operative healing if adequate radiation is used; (3) the relative radio-resistance of mammary cancer to doses of radiation which will still permit the safe execution of the surgical procedure.

The literature contains numerous references to statistical comparisons between the results of surgery alone and those of pre-operative radiation combined with surgery, with conclusions that indicate the merits of pre-operative radiation because of an increase in the percentage of cures. An improvement in results from 5 to 15 per cent is claimed. In my opinion the decision as to the merits of either pre-operative or post-operative radiation on the basis of statistical evidence is hazardous. Our inability to control and estimate various fundamental factors, such as the extent of the disease, the degree of malignancy, and the efficiency of the surgical and radiation procedures in large series of cases, renders it impossible to draw reliable and accurate conclusions from a comparison of one group of cases with another. Especially dangerous is it to estimate the efficacy of a particular therapeutic method when the difference in percentage of cures is so small as to be within the limits of error, which, because of the facts noted above, are unusually high. These are the difficulties which are encountered when one attempts to glean from the literature evidence concerning the value of pre-operative radiation in the treatment of mammary cancer. The reasons outlined also account for the widely divergent views held by equally careful observers and eminent authorities upon this question. These difficulties force us to turn to other than statistical studies for evidence upon this perplexing and difficult problem.

Post-operative radiation is generally accepted and employed by most radiologists, and many surgeons have adopted this procedure as an adjunct to surgery in the treatment of mammary cancer. Again, the statistical evidence that is quoted in support of and against the value of post-operative radiation must be interpreted critically and with the greatest caution. It would seem from the most authentic figures that the value of post-operative radiation increases in the more advanced lesions, *i.e.*, when the axillary glands have already been invaded. It is logical to believe that prophylactic post-operative radiation is of benefit especially under circumstances in which the entire disease is in all probability not removed by the surgical procedure alone. Whether or not prophylactic post-operative radiation diminishes the chances of local recurrence and increases the probabilities of cure in the early localized lesions is difficult to state. The evidence in the literature is conflicting, although the more recent reports indicate an improvement in results by the combined method over surgery alone.

It is important to appreciate in this connection that whereas the surgical treatment of mammary cancer has been standardized for some years, the radiation treatment of this disease is even today in a state of evolution. Thus, our conception of radiotherapy at the present time is undergoing changes fully as significant as the change from local surgical excision to the radical Halstead operation for mammary cancer. In estimating the value of radiotherapy, therefore, in relation to any problem, this fact must be taken into consideration. So rapid is the development in the principles and technique of radiation that by the time an interval of three years has elapsed following the use of a given radiotherapeutic method, the technique has become obsolete and been replaced. The last three years have witnessed the most rapid strides in radiotherapy and the results of these newest methods are yet not available. These circumstances render it even more difficult to base

present-day procedure upon published statistical studies.

A study of the available authentic evidence, and my own personal experience, have led me to adopt the following attitude toward this question. The results of the surgical treatment of mammary cancer are far from satisfactory. The essential reason for this fact is that cancer of the breast is a highly malignant type of cancer, and undergoes early and wide dissemination during the course of its development. The extent of this dissemination is difficult to determine by clinical examination, and there can be no doubt that many patients who suffer from small apparently localized neoplasms already harbour in the bones or viscera metastatic foci which are not demonstrable by our present methods of examination, but which become evident later in the course of the disease.

The radical surgical operation succeeds in removing the entire disease in a very small percentage of cases that are treated, and is accompanied by some danger of disseminating the disease to a degree which it is not possible to determine.

A certain small percentage of mammary carcinomata are radiosensitive. The value of radiation as an adjunct to surgery in this group is unquestionable. The modern technique of radiation is apparently proving to be effective in the larger group of mammary carcinomata which were formerly regarded as radio-resistant. These circumstances lead me to the view that radiotherapy must be looked upon as an adjunct to surgery in the treatment of carcinoma of the breast.

Based upon these facts I employ prophylactic post-operative radiation as a routine procedure following radical mastectomy, beginning the irradiation immediately after primary healing has taken place, with the occasional exception of early localized lesions without axillary gland involvement. I utilize pre-operative radiation in selected cases as follows: (1) in very young women in whom the clinical setting is such as to lead one to suspect the existence of a highly malignant anaplastic carcinoma, a type in which the results have been extremely unsatisfactory by surgery alone, and (2) in lesions of borderline operability. In both circumstances the radical operation is also followed by post-operative radiation.

THE USE OF RADIATION IN THE TREATMENT OF OPERABLE MAMMARY CANCER

Experience is gradually accumulating upon the ability of radiation alone to cure mammary cancer. Many radiologists and some surgeons have utilized radiation to the exclusion of surgery under circumstances in which the removal of the breast either has been contraindicated or refused. The extensive use of radium in the treatment of operable cancer of the breast has been carried out notably by Keynes in London. The information that Keynes is accumulating upon the question will prove of the greatest value and is being observed with the keenest interest. His experience thus far has led him to the opinion that the results of radium are superior to those of surgery in the treatment of operable mammary carcinoma. Whether the late results of his treated cases will permit him to maintain this position only time will tell. My experience with the treatment of presumably operable mammary cancer by radiation alone has convinced me of the ability to control and eradicate the primary growth in the breast and the difficulty of eradicating the disease in the axillary lymphatic glands. I have treated a small group of cases by the implantation of removable platinum needles in the breast and axilla. In some cases I have combined the implantation with intensive external radium therapy with the four-gram radium "bomb". In several cases I have treated the breast and axilla with the radium pack through multiple portals, with divided doses according to the principles of Coutard, and it is quite possible that with massive radiation therapy in large doses a sterilization of carcinoma in the axillary lymphatic glands may be accomplished. One patient received 270,000 milligram hours of radium over a period of three months. The disease, which was present in the axillary lymphatic glands and breast, has been temporarily controlled.

The ultimate success of the present efforts to replace surgical removal of the breast by radiation remains for the future to determine. Until the evidence is more adequate than it is at present the radical surgical removal of the breast combined with radiation must remain the procedure of choice in all carcinomata of the breast which are presumably operable.

TOTAL ABLATION OF THE THYROID GLAND IN THE TREATMENT OF ANGINA PECTORIS AND CONGESTIVE HEART FAILURE*

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THE pioneer work of Sir James Mackenzie has led to great improvement in the diagnosis and treatment of cases of heart disease in the present century. The intelligent restriction of fluid, increase of rest, the proper use of digitalis, etc., have all contributed to increasing the comfort and prolonging the lives of patients with heart failure. The more general recognition of cardiac infarction and its separation from angina pectoris is an important advance, as it has removed much of the dread from angina pectoris, and has stimulated attempts to improve the treatment of its victims.

The present conception that angina pectoris is almost always due to coronary disease interfering with the blood supply to the heart has resulted in the cases being treated more rationally and successfully, by clearing up infection, by regulation of physical and emotional activity, and by the use of coronary artery dilators of the theobromine group, which have a more prolonged action than the nitrites.

Recently various operative procedures involving destruction of various parts of the cervical sympathetic nervous system have had a vogue in the relief of angina pectoris. This form of treatment has been largely discarded because the operative risk is high, and, while pain is often relieved, it is almost certain that section of the cervical sympathetic nerves narrows the coronary arteries and therefore decreases the already insufficient blood supply to the heart. Another operative form of treatment for angina pectoris, namely, section of the white rami of the upper six left dorsal nerves, offers a high percentage of relief from pain, with no operative mortality, but again results in decreased blood supply to the heart. Nearly two years ago, Blumgart and Levine, of Boston, began to have a series of cases of angina pectoris and of heart failure which failed to clear up under prolonged treatment subjected to total thyroidectomy, and they reported very gratifying results.

Angina pectoris.—The rationale of total thyroidectomy in the case of angina pectoris is as follows. The work of the heart varies directly with the metabolic rate, and by making a patient with a normal metabolic rate hypothyroid the work of the heart is thereby lessened, and, angina pectoris being due to the heart working in the presence of an inadequate blood supply, improvement may be expected as a result of the diminished work. The results of total thyroidectomy in the cases reported from Boston are surprisingly good—the common findings being that anginal attacks occurring at rest (so-called "angina decubitus") disappeared immediately after operation and that the angina of effort improved, up to complete relief in some cases.

It was decided at the Toronto General Hospital to try out this apparently formidable method of treatment in a small number of cases of angina pectoris, and after a few months had elapsed to consider the results and determine whether one would be justified in advising other patients, similarly afflicted, to undergo total thyroidectomy. It was felt that, as only a small series was to be done, it was desirable that one surgeon should do the whole series. Professor Gallie agreed to this suggestion and very kindly consented to do the work himself. An attempt to measure the exercise tolerance was made in all cases, and, in addition, basal metabolic rates, blood calcium and blood phosphorus estimations were determined before and at intervals after operation. Total thyroidectomy has been done in 5 cases of severe angina pectoris after they had been under observation for more or less prolonged periods.

A brief description of these cases follows.

CASE 1

Mr. S.J., aged 61, began having attacks of angina pectoris in June, 1930. They became progressively worse until February, 1934, when præcordial pain appeared on walking two or three blocks or on undressing. On a walking test pain appeared on walking 300 feet along the hospital corridor before operation and on walking 660 feet three weeks after operation. The basal metabolic rate before operation varied from 90 to 95 per cent and from 90 to 83 per cent after operation. As in all the other cases the blood calcium fell and the

* Read before the Section of Medicine, Academy of Medicine, Toronto, October 9, 1934.

blood phosphorus rose shortly after operation and slowly returned to the previous level.

For four months after his operation the patient was able to walk longer distances before pain appeared, but in August his exercise tolerance fell back to the pre-operative level. In September, however, he could again walk farther, and he stated that the operation was worth while because he had less pain and could do more.

This patient has benefited little if at all, and the failure to obtain more striking improvement may be explained by the very slight fall in his basal metabolic rate.

CASE 2

Mr. J.L., aged 43, had an attack of coronary thrombosis in 1930. He made a good recovery until early in 1933, when he began to have attacks of angina pectoris, culminating in another attack of coronary thrombosis in March, 1933. Following this his angina appeared on very slight provocation and became progressively worse, so that he was confined to bed from July, 1933, until after his operation on April 6, 1934. While in bed the effort of turning over, or sitting up, or any slight emotional strain caused anginal attacks so severe that he required morphine almost daily in doses up to 1½ grains.

Total thyroidectomy was performed on April 6th. Morphine was discontinued on the fourth day, and he was given luminal by day and paraldehyde at night because he was fidgety.

While in hospital he had many bouts of præcordial pain daily before operation, but no præcordial pain after. He was out of bed in two weeks, and was able to walk slowly round his room at the end of another week, when he was discharged. A few days after returning home he discharged his nurse who had been with him for the previous nine months.

When seen in August his face was puffy; he complained bitterly of the cold. He was out of bed ten hours daily and walked six blocks thrice daily. He had had no præcordial pain, but suffered considerably from backache and stiff tired feet and legs. He had used Dial on three occasions since operation. His basal metabolic rate was 71 per cent, and on August 20th he was started on ½ gr., once daily, of Parke, Davis' thyroid.

On October 2nd his basal metabolic rate was 82 per cent and his walking was up to eight blocks, longer distances being impossible on account of fatigue, stiff legs, and soreness in his back and chest.

This man's present condition leaves much to be desired, as he is still unable to work, but he is certainly a great deal better off than before operation when he was confined to bed for months, in daily pain necessitating the use of large doses of morphine.

CASE 3

Mr. T.C., aged 52, had had angina pectoris since January, 1930; an attack of coronary thrombosis in March, and another in August, 1933. On a walking test pain developed after 240 to 360 feet before operation, and three weeks after operation he walked 1,800 feet without pain.

His basal metabolic rate was 95 to 96 per cent before operation and fell to 69 per cent after operation, which was done on April 24, 1934. He has had no pain since operation, although he has often walked over a mile. When seen in August he looked myxœdematous, and his basal metabolic rate being 69 per cent, he was given ½ gr., once daily, of Parke, Davis' thyroid. At the end of September his basal metabolic rate was 80 per cent, and he was still free from pain and felt the cold less.

This patient has been greatly benefited as he has been completely free from pain and can walk over a mile.

CASE 4

Mrs. H., aged 62. Angina pectoris appeared at the end of 1933, and she had an attack of coronary thrombosis in February, 1934. Following this, præcordial pain developed on the slightest effort in bed, such as washing herself or using the bed pan. Her basal metabolic rate was 88 per cent, and thyroid was administered, bringing her rate up to 97 per cent without any improvement, and she had daily attacks of pain in bed until June 29, 1934, when total thyroidectomy was done. She had no pain after operation until an attack of coronary thrombosis supervened on July 16th.

At the end of August she was able to walk around the ward without pain, and since going home has had pain on three occasions while bathing. Her basal metabolic rate before operation was 88 per cent, and since operation has varied from 85 to 93 per cent, the latter being on October 3rd.

This patient has definitely improved in spite of the fact that the basal metabolic rate was not lowered by the operation.

CASE 5

Mrs. E., aged 59, had had angina pectoris for over two years, and recently it had appeared on very slight exertion and even on rest in bed. Her basal metabolic rate before operation was 102 to 110 per cent, and it fell to 87 per cent at the end of September, which was two months after operation. She has had no pain since operation and has walked several blocks on many occasions.

While only two and a half months have elapsed since operation, it would seem reasonable to include this patient among those greatly improved.

The results in these five cases vary, from questionable improvement in the first case to apparently complete relief in at least two of the cases. In the two cases least improved, namely, the first man and the first woman, there was no appreciable fall in the basal metabolic rate as a result of the operation. There are several possible explanations of the relief in such cases. The improvement may be due to the work of the heart being diminished by the lowered basal metabolic rate and, in addition, in the hypothyroid state the metabolism of the heart itself is lessened. But the improvement after the operation occurs too soon for these explanations to be entirely satisfactory and in the case of the first woman definite improvement occurred without any fall in the basal metabolic rate.

It has been suggested that total thyroidectomy affects the adrenals, lessening the output of epinephrine and thereby lessening the sensitivity of the sympathetic nervous system. Another view is that in the course of the operation certain unidentified sympathetic fibres are cut, and impulses from the heart which are interpreted as pain are thereby cut off.

Heart failure cases.—In cases of heart failure the velocity of the blood flow is reduced so that the blood supply to the tissues is inadequate for the metabolic needs. In people with healthy hearts the velocity of the blood flow varies directly with the metabolic rate. In hyperthyroidism the velocity of blood flow is increased and in hypothyroidism is decreased. Further it is a well known observation that hyperthyroid patients with congestive failure often improve to the extent of entire disappearance of failure after subtotal thyroidectomy. Blumgart and Levine reasoned that by making heart failure cases hypothyroid by total thyroidectomy the reduced blood flow might become adequate for the resulting reduced metabolic requirements. They report satisfactory results in their series of heart failure cases so treated.

A report of 4 cases of severe heart failure subjected to total thyroidectomy follows. These patients had all failed to improve after prolonged rest in bed, restriction of fluids and the use of diuretics.

CASE 6

Mr. S., aged 44. Dyspnœa on exertion and at night began in 1929, and dependent œdema appeared in 1930. He was in the Toronto General Hospital in 1931 with marked failure, pleural effusion, large liver, etc. The failure passed off and he was able to do light work until October, 1933, when dyspnœa and swelling of the legs reappeared. He was admitted to the hospital with ascites, pleural effusion, and œdema extending up to the trunk. He did not improve and at the end of February he was almost moribund for several days. Following this, he improved slightly, and he was advised to have a total thyroidectomy, which was done on March 12th. His basal metabolic rate before operation was 98 to 101 per cent and fell to 65 per cent in July. He was out of bed three weeks after operation, free from failure, and in the course of the next month walked several miles at a stretch, and climbed four flights of stairs in a large department store to test his wind. He returned to work, but shortness of breath and œdema returned in July, when his basal metabolic rate was 65 per cent and he was given ½ gr. thyroid (P., D. & Co.), daily. The failure rapidly cleared up and he had an operation for hernia in September.

This patient showed remarkable improvement immediately after thyroidectomy, but he had improved similarly in 1931. The failure which appeared four months afterwards may have been due to cardiac myxœdema, but its disappearance when he was taking thyroid substance may or may not have been due to the medication.

CASE 7

Mrs. M., aged 43, had rheumatic heart disease, with auricular fibrillation, mitral and aortic stenosis. She was admitted to the Toronto General Hospital in July, 1933, with very marked failure, which cleared up, but returned when she got out of bed. Later the failure appeared while she was in bed, and gradually diuretics lost their effect, and on March 28, 1934, total thyroidectomy was done. Her basal metabolic rate was 86 to 93 per cent before and 86 to 77 per cent after operation. She did well for a time, and then slowly went down hill and died two months after operation.

It is probably a fair comment that the operation did not hasten the end.

CASE 8

Mrs. B., aged 48, is a case of degenerative heart disease, with symptoms beginning in 1931 following influenza. By September, 1933, she was short of breath on walking 50 feet, and was in the Toronto General Hospital in October, 1933, with failure which cleared up rapidly, only to reappear in January, 1934. She was readmitted in March, cyanosed, œdematous, and dyspnœic. Her basal metabolic rate was 106 to 110 per cent before, and fell to 81 per cent after operation which was done on March 31st. She developed tetany a week after operation, but this was readily controlled by calcium lactate. Her blood calcium at the time was 4.9 and her phosphorus was 6.1. She signed out of hospital three weeks after operation, and has been in bed ever since on restricted fluids and diuretics. She was readmitted at the end of August, œdematous, dyspnœic, and jaundiced. Tetany reappeared two weeks later, when her blood calcium was 6.4 and the phosphorus was 4.8. At present she is somewhat improved but still in bed, and cannot be included among those benefited.

CASE 9

Mrs. S., aged 34, a case of rheumatic heart disease, with failure for the past nine years, and confined to bed for six months before operation. Her basal metabolic rate was 116 per cent, and she was operated on on May 2, 1934. During operation marked tachycardia developed and the operation was stopped. After returning to bed acute œdema of the lungs occurred, and persisted, and she died next day.

The results of total thyroidectomy in these 4 cases of severe intractable heart failure are, one death due to operation, one death not attributable to operation, one case unimproved, and one case at least temporarily improved.

The results have been encouraging in the case of angina pectoris, but decidedly depressing in the group with failure. It may be that the failure cases were badly chosen, as they were all very severe cases of recurrent and persistent failure, and less advanced cases might have shown better results.

It must be remembered that certain cases of hypothyroidism show heart failure which disappears on thyroid medication, and it is prob-

able that the very low basal rates such as 65, 69 and 71 per cent are too low, and that these patients would be better at levels between 75 and 80 per cent. It is interesting to note that no cases of thyroid storm followed operation, and that, with one exception, all the patients stood the operation well.

In the Annual Report of the Peter Bent Brigham Hospital, Professor Christian, discussing this matter, points out that it is too early to fully evaluate the procedure, and he suggests that the improvement in the anginal cases may be due to some other factor than removal of the thyroid. He predicts that the improvement in the heart failure cases will be temporary.

While the number of cases presented in this series is small, it would appear justifiable to conclude that total thyroidectomy offers a good prospect of improvement in cases of severe angina pectoris, especially in those suffering from attacks at rest. On the other hand, patients with marked persistent failure should not be encouraged to submit to the operation, as the risk is fairly high and the improvement small.

MEDICO-LEGAL APPLICATIONS OF BLOOD-GROUPING, WITH SPECIAL REFERENCE TO THE AGGLUTINOGENS M AND N OF LANDSTEINER AND LEVINE*

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INTEREST in the medico-legal applications of blood grouping has been aroused recently by a decision of the Supreme Court of the State of New York in which blood tests were ordered to settle the problem of paternity of a child.† Since there have been many misconceptions concerning this subject, particularly among the legal profession,‡ a brief review would be of value at this time.§

The four Landsteiner blood groups, O, A, B, and AB, are known to the medical profession principally because of their importance for blood transfusion. Since the heredity of the classic blood groups has also frequently been discussed in articles and editorials published in the various medical journals, it will suffice merely to give a Table summarizing this subject (see Table I).

TABLE I

THE LANDSTEINER BLOOD GROUPS IN PARENTS AND CHILDREN

Groups of parents	*Groups of children possible*	*Groups of children not possible*
1. O x O	O	A, B, AB
2. O x A	O, A	B, AB
3. O x B	O, B	A, AB
4. A x A	O, A	B, AB
5. A x B	O, A, B, AB	——
6. B x B	O, B	A, AB
7. O x AB	A, B	O, AB
8. A x AB	A, B, AB	O
9. B x AB	A, B, AB	O
10. AB x AB	A, B, AB	O

In 1927, Landsteiner and Levine[1] discovered the existence of additional individual differences in human blood by means of immune sera prepared by injecting human blood into rabbits. Two of the agglutinogens detected with these immune sera, termed M and N, have been thoroughly studied since that date. As Landsteiner and Levine pointed out, three types of individuals may be distinguished with the aid of

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† This order was issued by Justice Meier Steinbrink, whose learned opinion is given in full in the *New York Law Journal* (Beuschel v. Manowitz) for January 2, 1934.

‡ See Wiener, A. S.: Genetics and the Law, *St. John's Law Review*, 1933, **8:** 70; Determination of Non-Paternity by Blood Groups, *J. Am. M. Ass.*, 1932, **90:** 242.

§ For more extensive reviews on the general subject, including technique, see: Landsteiner, K.: The Human Blood Groups, in Jordan and Falk's Newer Knowledge of Bacteriology and Immunology, Chicago, 1929, p. 892; Lattes, L.: The Individuality of the Blood, Oxford Medical Publications, London, 1932; Levine, P.: Menschliche Blutgruppen und individuelle Blutdifferenzen, *Ergeb. Inn. Med. u. Kinderheilk.*, 1928, **34:** 111; Schiff, F.: Die Technik der Blutgruppenuntersuchung, Julius Springer, Berlin, 1932; Schiff, F.: Die Blutgruppen und ihre Anwendungsgebiete, Julius Springer, Berlin, 1932; Snyder, L. H.: Blood Grouping in Relation to Legal and Clinical Medicine, Baltimore, 1929; Steffan, P.: Handbuch der Blutgruppendunde, J. F. Lehmann, Munich, 1932; Wiener, A. S.: Blood Groups and Blood Transfusion, Charles C. Thomas, Springfield, Ill. (in press).

these agglutinogens, namely, type M or M + N – (individuals possessing agglutinogen M, but not agglutinogen N); type N or M – N + (individuals only possessing agglutinogen N); and type MN or M + N + (individuals possessing both agglutinogens M and N). Individuals of type M – N – (lacking both agglutinogens) are non-existent. Further, the agglutinogens M and N are entirely independent of the agglutinogens A and B that determine the classic blood groups, so that individuals of group O, for example, can be further differentiated into three types, M, N, and MN. In all, 12 distinct types of blood can be distinguished with the aid of the four agglutinogens, A, B, M, and N (see Table VI). In most of the populations examined thus far the distribution of the agglutinogens M and N is approximately as follows: type M, 30 per cent; type N, 20 per cent; and type MN, 50 per cent.*

If potent specific reagents are available, it is almost as simple to test for the factors M and N as for A and B. The most difficult part of the technique is in the preparation of the testing fluids. As has already been pointed out, the sera are usually prepared by immunizing rabbits with human blood. To prepare anti-M sera, blood of type M is injected, and to prepare anti-N sera, type N blood is used. The blood selected for the immunization should also belong to group O, in order to prevent the formation of antibodies against A and B. The exact method of immunization does not seem to make much difference provided that the injections are continued over a long enough period of time. As a rule, it is more difficult to obtain potent anti-M sera than to obtain potent anti-N sera. In a number of cases, where the rabbits failed to respond satisfactorily after 4 to 6 weeks of immunization, a long rest period followed by another course of injections resulted in the formation of specific agglutinins of high titre. The difficulty in the M/N technique arises from the fact that the immune sera contain not only the specific agglutinin (anti-M or anti-N) desired, but also potent species-specific agglutinins acting on all human blood. Before the sera can be used, therefore, they must be treated to remove the species agglutinins. Thus, after suitable dilution with normal saline solution (usually 1:15 to 1:50), and after inactivation (to destroy the complement), the anti-M sera is mixed with a suitable volume of type N (not containing agglutinogen M) blood. After the mixture has stood for 30 minutes at room temperature it is centrifuged, and the sediment of agglutinated cells discarded. The supernatant fluid now contains the anti-M agglutinin alone, and is ready for use. A similar technique is used for preparing the specific anti-N fluid.

The actual tests are performed by mixing one drop of a 1 to 2 per cent suspension of each blood to be tested with a drop of the specific anti-M testing fluid in small test-tubes (inside diameter 8 mm.); and another drop of the blood suspension with the anti-N fluid. The reactions are read after the mixtures have stood for one hour at room temperature; or the tubes may be centrifuged for 3 minutes at about 2,000 r.p.m., then shaken and the reactions read. It is important to include control blood suspensions of all three types, M, N, and MN in every experiment. The tests can also be performed on glass slides, but this technique has the disadvantage that it cannot be controlled as well.*

As Landsteiner and Levine[2] have pointed out, the heredity of the three M/N types is determined by a single pair of allelomorphic genes, *M* and *N*. Every individual must possess two of these genes (one derived from each parent). Hence three *genotypes* are possible corresponding to the three known *phenotypes* as follows:

Types	*Genotypes*
M	*MM*
N	*NN*
MN	*MN*

This theory therefore explains the non-existence of individuals lacking both agglutinogens M and N. The mechanism of heredity of the M/N types is easy to understand if it is borne in mind that as a result of the reduction division in the process of maturation of the germ cells, each sperm and ovum will contain only one of the genes, *M* and *N*, whereas the somatic cells

* Only one case is known of a human serum containing an isoagglutinin for M, and, thus far, no case has been found with an isoagglutinin for N. (See Wolff, E. and Johnson, K.: Studien über die Untergruppen A_1 und A_2 mit besonderer Berücksichtigung der Paternitätsuntersuchungen, *Deutsche. Zeitschr. f. d. ges. gerichtl. Med.*, 1933, **22**: 65. For this reason, the agglutinogen M and N rarely, if ever, play any part in transfusion reactions.

* For further details concerning the technique refer to footnote on page 393 and Zinsher, R. and Selkowe, J.: The Agglutinogens M and N of Landsteiner and Levine, *J. Immunol.* (in press).

contain two. An individual of type M will therefore only produce germ cells containing gene *M*; type N individuals will only produce germ cells containing gene *N*; whereas type MN individuals produce equal numbers of germ cells bearing gene *M* and gene *N*. Hence, two type M individuals can only give rise to type M children, and not type MN or type N. In matings between type M and type MN individuals, half of the offspring will belong to genotype *MM* and half to genotype *MN*, corresponding to type M and type N, respectively. The other matings listed in Table II were worked out in the same way.

TABLE II

HEREDITY OF THE AGGLUTINOGENS M AND N OF LANDSTEINER AND LEVINE

Types of parents	*Percentage of children of types* M	N	MN
M x M	100	0	0
N x N	0	100	0
M x N	0	0	100
M x MN	50	0	50
N x MN	0	50	50
MN x MN	25	25	50

The accuracy of the theory of heredity proposed by Landsteiner and Levine has been confirmed by the investigations of a number of independent workers, including the present author. Thus, in more than 20,000 blood specimens examined not a single blood lacking both agglutinogens M and N has been found. The results of all the available studies on the heredity of the M/N types in complete families is given in Table III. In this series of 910 families with

TABLE III

HEREDITY OF THE AGGLUTINOGENS M AND N

(Summary of the studies of Landsteiner-Levine, Wiener-Vaisberg, Schiff, Schiff-Sasaki, Thomsen-Clausen, Clausen, Lattes-Garrasi, and Blaurock).

Types of parents	*Number of children of types* M	N	MN	*Totals*
M x M	203	0	*1*	204
N x N	0	107	0	107
M x N	0	*2*	205	207
M x MN	317	*3*	362	682
N x MN	*2*	280	268	550
MN x MN	149	135	331	615
Totals	671	527	1,167	2,365

2,365 children, only 8 cases were found which did not conform with the theory. That these "exceptions" can be attributed to illegitimacy has been proved by the study of the M/N types in mothers and children. If the theory is correct, it is impossible for a type M parent to give rise to a type N child or for a type N parent to give rise to a type M child. And, as a matter of fact, although 6,609 mother-child pairs have been examined to date, not a single

TABLE IV

SUMMARY OF ALL MOTHER-CHILD COMBINATIONS

Investigators	*Number of mothers*	*Number of children*
Landsteiner and Levine (families)	64	286
Wiener and Vaisberg (families)	131	642
Schiff (families)	72	192
Clausen and Thomsen (families)	390	577
Lattes and Garrasi (families)	117	202
Schiff and Sasaki (families)	56	186
Blaurock (families)	80	280
Total (Table III)	910	2,365
Wiener, Rothberg and Fox	461	497
Lauer	425	431
Laubenheimer	250	250
Crome	124	133
Schiff	2,565	2,589
Mayser (families)	65	209
Mayser	85	85
Crome (families)	22	50
Grand totals	4,907	6,609

such exception to the theory of Landsteiner and Levine has been found. This proves conclusively that the theory holds as far as the mother is concerned, and since the agglutinogens M and N are independent of sex in their heredity, the same statement must hold for the father. The apparent exceptions in Table III all involve the father and are therefore attributable to illegitimacy.*

Blood grouping has been applied medico-legally in two sorts of cases, namely, in cases of disputed paternity or maternity, and in criminal cases in which the problem of determining the source of blood stains arises. The medico-legal applications of blood grouping are based on the following properties of the individual blood differences:

1. Every person must belong to one of the four groups, O, A, B, and AB, and to one of the three types, M, N, and MN. The blood group and M/N type of each individual can readily be determined, provided that the proper reagents are available and the person performing the tests has had adequate experience.

* For statistical proof of the accuracy of the theory of Landsteiner and Levine, see Wiener, A. S.: Heredity of the Agglutinogens M and N of Landsteiner and Levine, II. Theoretico-Statistical Considerations, *J. Immunol.*, 1931, **21:** 157. Wiener, A. S. (footnote § page 393).

2. The blood groups (and M/N type) of any individual can be determined at birth, or at the latest, during the first few months after birth, and remains unchanged throughout life regardless of disease, age, drugs, etc.

3. The blood groups and M/N types are inherited by means of a simple and exact mechanism.

The method of applying blood grouping in filiation cases is best illustrated by citing an actual case. In a case tried before the Court of Common Pleas of New Haven County on January 17, 1933, a woman falsely accused a man of the paternity of her child. The bloods were sent to the present author for examination, and it was found that the man belonged to group A, the woman to group O, and the child to group B. Since the child possessed an agglutinogen B not present in its mother's blood, the true father must belong to group B or group AB (see Table I). Confronted with this evidence the woman withdrew her charge and the man was acquitted. In this case, therefore, the blood-grouping tests exonerated an innocent man who otherwise would certainly have been convicted.

Suppose, however, that in the case just cited it had been found that the accused man belonged to group B or AB. This would not prove he was the true father any more than any other man belonging to either of these groups. In such an event, the blood-group evidence would be of no avail. Blood grouping can therefore only be used to *exclude* paternity and not to prove paternity.

The agglutinogens M and N are applied in filiation cases in the same way as the classic Landsteiner blood groups (see Table V).

TABLE V
THE AGGLUTINOGENS M AND N IN PARENTS AND CHILDREN

Types of parents	*Types of children possible*	*Types of children not possible*
1. MN x MN	M, N, and MN	——
2. MN x N	N and MN	M
3. MN x M	M and MN	N
4. M x N	MN	M and N
5. N x N	N	M and MN
6. M x M	M	N and MN

The following case is cited to illustrate the method of applying all four agglutinogens, A, B, M, and N together.

After 8 years of married life, during which time she had had frequent intercourse with her husband but had failed to become pregnant, Mrs. X had relations with a certain Mr. Y. During the following 5 years, 3 children were born. Mrs. X decided to leave her husband for Mr. Y, whom she believed to be the father of her children. Mr. X felt that the children were his, however, and after conferring with one another amicably the individuals involved in the case decided to have blood tests performed to solve their problem. The results were as follows:

Blood of	*Group*	*Type*
Husband	O	MN
Lover	A	N
Wife	O	MN
First child	O	MN
Second child	O	M
Third child	A	N

Since two group O parents can only have group O children, the third child could not be the husband's, but could be the lover's. On the other hand, since a type N individual cannot have a type M child, the second child could not be the lover's, but could be the husband's. No decision can be made concerning the first child. In this case, therefore, the blood tests have established the paternity of 2 out of 3 children, since it follows by exclusion that the second child is the husband's and the third is the lover's.*

As has already been pointed out, not in every case where a man is falsely accused of paternity will blood grouping establish his innocence. For example, if the falsely accused man and the true father belong to the same group, no definite statement will be possible. If only the four classic groups are tested for, one-sixth of the falsely accused men can be exonerated.† If the M/N types of the individuals involved are also determined, the chances of proving non-paternity are doubled,

* The two cases which have just been cited were reported previously (Wiener, A. S.: Determination of Non-Paternity by Means of Blood Groups, *Am. J. M. Sc.*, 1933, **186:** 257).

† The chances of proving non-paternity depend upon the distribution of the blood groups in the population. The figures cited in this paper are based on the distribution of the groups in New York City. For general formulæ that can be applied to any population, see Wiener, A. S.: On the Usefulness of Blood Grouping in Medico-legal Cases Involving Blood Relationship, *J. Immunol.*, 1933, **24:** 443.

so that one out of every three falsely accused men can be cleared by these tests.

In practice, of course, the percentage of exclusions will be lower, since not every accused man is innocent. If only half of the men are falsely accused, for example, the combined tests for A, B, M, and N should yield 16.5 per cent of exclusions. Schiff,[3] in Germany, using the two methods simultaneously, has excluded 14.7 per cent of the accused men in a series of 1,051 actions. This indicates that $14.7 \times 3 = 44.1$ per cent of these 1,051 men had been falsely accused. Interestingly enough, Wolff and Jonsson, in Sweden, and Clausen[4] in Denmark have also found the percentage of false accusations to range between 40 and 50 per cent. Since blood grouping has not been applied very extensively in this country thus far, statistics are not available concerning the percentage of false accusations here. However, since human nature in the United States is probably a good deal like human nature in Denmark, Sweden and Germany, one can assume that in this country also, a large percentage of the supposed fathers in filiation cases are not the actual fathers. Yet, the experience has been, especially in jury trials, that an accusation is followed by a conviction in the vast majority of cases. A good deal of this injustice will be prevented by making the blood grouping tests a routine procedure in all filiation proceedings. The value of the tests is not restricted to those cases in which an actual exclusion is obtained, since the tests also have a potent psychological effect. Fear that the falsity of their accusations will be revealed and that they will be liable for perjury will deter women from making false charges. The psychological effect on the man is also important, as in the following case:

A man who desired to divorce his wife claimed that the child that had been born shortly after the marriage was not his, and demanded blood tests to prove his charges. The woman came to me with the child, and gladly submitted to the test, apparently believing that it would exonerate her. The man failed to appear, and at the eleventh hour refused to submit to the tests, which he himself had originally requested. Naturally, only one conclusion could be drawn.

Occasionally, it may only be possible to test the bloods of the man and child and not of the mother. Thus, the author has been consulted in several cases where a man suspected his wife of infidelity, but did not wish to make any charges before obtaining further evidence. If it is found that the supposed father belongs to type M and the child to type N, or *vice versa,* non-paternity is established, regardless of what type the mother belongs to. Similarly, with the classic blood groups, group AB cannot give rise to group O, and group O cannot give rise to group AB. Because of the comparative rarity of group AB, the M/N types are far more useful than the classic blood groups in cases where the blood of one of the parents cannot be tested. Aside from the cases where an exclusion is possible without examining the mother's blood, two other types of cases can be distinguished. In one type, *e.g.,* when both man and child belong to group A, or when the man belongs to type MN, it is useless to test the woman's blood, since no exclusion is possible regardless of what her type is. On the other hand, if it is found that the man belongs to group O and the child to group B, for example, or the man to type M and the child to type MN, no decision is possible without examining the mother's blood.

As has already been pointed out, a falsely accused man can be exonerated in one case out of three by the combined use of A, B, M, and N. If the type of the unjustly accused man is known, the chances of proving non-paternity can be more sharply defined. In Table VI, the chances of proving non-paternity for men of each of the twelve possible types are given.

TABLE VI

CHANCES OF PROVING NON-PATERNITY, WHEN THE TYPE OF THE FALSELY ACCUSED MAN IS KNOWN

(The calculations are based on the distribution of the agglutinogens A, B, M, and N in New York City).

Type of the falsely accused man	*Chances of proving non-paternity percentage*
O – M	50.7
O – N	56.0
O – MN	25.2
A – M	40.4
A – N	46.7
A – MN	9.1
B – M	43.6
M – N	49.6
B – MN	14.4
AB – M	58.4
AB – N	62.8
AB – MN	36.8
Unknown	33.1

This Table should prove useful in cases like the one described by Hooker and Boyd.[5] In this case, a man was alleged, incorrectly, he said, to be the father of an illegitimate child. The court had ruled in favour of the child's mother, and had ordered the man to contribute to the support of the child for a prolonged period of years. The man wanted to know what the chances were that he would be able to prove non-paternity by means of blood-grouping tests, so that he might decide whether it would be worth-while to attempt reopening the case. This would involve a not inconsiderable expense for counsel, laboratory work, expert witnesses, etc. Hooker and Boyd made the requisite calculations, but only on the basis of the four Landsteiner blood groups. Table VI also takes the M/N types into account.

Another type of case in which blood grouping has been successfully applied is where newborn infants have been accidentally interchanged or mislabelled in hospitals. As an example, the hospital case in Chicago (1930) may be cited.* One week after taking their baby home, Mr. and Mrs. B. discovered that their baby had a label on its back with the name W. At the W. home the baby was found to bear the label B. All six individuals were then typed and the results were as follows:

Mr. B.	Group AB	Mr. W.	**Group O**
Mrs. B.	Group O	Mrs. W.	Group O
Baby bearing label "W."	Group O	Baby bearing label "B."	**Group A**

Since a group A child is impossible for the W. family, but possible for the B. family, and since a group O child is impossible for the B. family, though possible for the W. family, it is obvious that the babies had been properly labelled but taken to the wrong homes.

In this particular case it was unnecessary to test for M and N, since the problem was solved with the aid of factors A and B alone. The chances of detecting interchange of infants by either of the two methods are approximately 2 in 5; and if all four agglutinogens A, B, M, and N are tested for, fully 70 per cent of the cases can be solved.

Landsteiner and Richter were the first to demonstrate that it is possible to determine the group of old, dried, blood.* And Lansteiner and Levine showed that the M/N type of dried blood can also be determined.† This is of obvious importance in criminal cases where blood stains are found at the scene of the crime or on the clothes of a suspect. The proper procedure to follow is first to demonstrate that the stain is really blood by the usual chemical spectroscopic, and microscopic tests, then to determine whether or not the blood is of human origin by the precipitin test, and finally, if it is of human origin, to determine the blood group and the M/N type.

As examples, to demonstrate the utility of blood grouping in criminal cases, two contrasting cases may be cited, one reported by Martin and Rochaix and the other by Popoff.‡ The French writers describe the following instance. In a murder case in which numerous blood stains were found at the scene of the crime, it was demonstrated that the blood was human in origin and belonged to group A. Since the suspected man belonged to group O, his claim that the blood stains had resulted from self-inflicted injuries was shown to be false. In the case reported by Popoff, two men had been wrongly accused of murder. The body of a woman with stab wounds on her face had been found in a forest near Moscow, and two farmers were arrested and charged with the crime. A sharp implement found in their possession fitted the wound on the woman's face. Blood-stains were present on the tools, but the farmers claimed that they had resulted from a fight with other men and had nothing to do with the murder. Popoff found that the blood stains on the implement came from an individual belonging to group B, whereas the murdered woman belonged to group O, so that the farmers' claims were corroborated. Shortly thereafter the real murderers were discovered.

Thus far, the properties M and N have not been found outside of the red blood corpuscles in normal persons. On the other hand, the

* The only periodical in which I could obtain a detailed description of this case was the popular magazine *Liberty* for October 11, 1930. On p. 36 is an article called "Whose Baby Am I?" by Grace Robinson.

* For details of technique, see Wiener, Lattes, or Schiff, footnote § page 393. Also see Levine, P.: The Applications of Blood Groups in Forensic Medicine, *Am. J. Police Science*, 1932, **3:** 157.

† The technique is given in detail by Lauer, A.: Zur Technik der Blutfleckdiagnose nach M und N, *Deutsche. Zeitschr. f. d. ges. gerichtl. Med.*, 1933, **22:** 86.

‡ Cited after Levine (footnote * page 398).

group-specific factors A and B have been demonstrated in almost every tissue of the body, and are also frequently present in the secretions and excretions. The presence of the properties A and B in semen has been applied in rape cases, and the fact that these properties may be found in saliva has proved useful in criminal cases where cigarette stubs were found at the scene of a crime. Since the dried saliva on envelopes may also reveal the presence of the group-specific factors A and B, the tests can be applied in kidnapping or blackmail cases. It must be borne in mind, however, that whereas the ability to demonstrate the presence of properties A and B in a stain proves these factors are also present in the individual from whom the stain was derived, the absence of A and B from dried saliva or seminal stains may be due to deterioration or failure to secrete the properties, and does not necessarily prove that the stains are derived from group O individuals.

SUMMARY AND CONCLUSIONS

Blood-grouping is of proved value in medico-legal cases of disputed paternity. Its application is based on experimental investigations on families involving tens of thousands of persons. Its reliability has also been established in more than 10,000 medico-legal cases in which it has been applied in various European countries. In this country, the method has thus far been applied only in a small number of cases, and its introduction as a routine procedure in all filiation cases is urged. Blood-grouping has also proved useful in criminal cases in which stains of blood, semen, or saliva were found.

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THE DIAGNOSIS AND TREATMENT OF INTESTINAL AMŒBIASIS*

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A YEAR before the recent epidemic of acute amœbic dysentery in the United States and Canada, Craig[1] estimated that between 5 and 10 per cent of the inhabitants of the United States were infected with *Entamœba histolytica*. He obtained this figure from the results of fourteen independent surveys which had been made in different parts of that country. With such a degree of latent infection, it is not surprising that an acute outbreak occurred in 1933; and, furthermore, if certain requirements for its transmission are again fulfilled, it is quite possible that other outbreaks may occur in the future. Intestinal amœbiasis, then, appears no longer to be a disease peculiar to hot countries, and for this reason the following observations, made during several years of practice in a part of Colombia where amœbiasis is prevalent, may be of interest.

Depending on the severity of the symptoms, cases of intestinal amœbiasis may be divided into three main types:—

1. *Acute amœbic dysentery.*—This is the type which runs a rapid and sometimes a fatal course, death resulting from exhaustion, from gangrene and perforation of the bowel, or from metastatic lesions in other viscera. This form is comparatively easy to diagnose, and, as a rule, responds rapidly to specific (emetine) therapy. Even the busiest practitioner, with neither the time nor the equipment to make more than the simplest laboratory tests, should be able to diagnose this type in its early stages and treat it successfully.

2. *Chronic amœbiasis.*—The diagnosis of this type is usually more difficult, and its treatment more protracted than that of the acute variety. The symptoms, however, are rarely urgent, and, as special laboratory procedures are often necessary for diagnosis, these cases lend themselves better to hospital than home management.

* From the Medical Department of the Tropical Oil Company, Barrancabermeja, Colombia, S.A.

3. *E. histolytica "cyst-passers".*—This type is in reality a mild form of chronic amœbiasis, as some degree of destruction of the bowel wall is always present. Typical cyst-passers, however, are completely symptom-free. Their detection and treatment among food handlers is of paramount importance, both in preventing and controlling epidemics, and they are therefore of special interest to the epidemiologist and public health officer.

Dobell and O'Connor[2] have described the pathological changes in the large bowel and the protozoal findings of each of the three types, in reverse order, as follows:

> "The ordinary person infected with *Entamœba histolytica* passes the cysts of the parasite in his stools. But he has the active forms of the amœba in the tissues of his gut wall, and precystic amœbæ in the contents of the intestine. If the amœbæ irritate his gut sufficiently, he suffers from diarrhœa . . . . In his stool we then find, therefore, large numbers of precystic amœbæ—often mixed with cysts in all stages of development. If the injury to the intestine is sufficiently severe the patient suffers from amœbic dysentery. Blood and mucus escape from the ulcerated areas, carrying with them numerous amœbæ from the damaged tissues. The amœbæ now found in the stools are therefore the large active forms, often containing ingested red corpuscles. In typical cases of acute dysentery, precystic amœbæ and cysts are absent from the stool".

It is apparent, then, that attempts to find active red-cell-containing amœbæ in patients with chronic amœbiasis, or cysts in cases with acute dysentery, are usually futile.

Acute Amœbic Dysentery

Signs and symptoms.—As the name would indicate, the most prominent symptom is the frequent passage of bloody mucoid stools, accompanied by some degree of tenesmus and pain. The diarrhœa may be very severe, but it rarely exceeds ten or fifteen movements in twenty-four hours. The stool is usually of moderate size, although if much tenesmus is present it may be so scanty that the patient is deceived into thinking himself constipated. It is highly odoriferous, and consists, typically, of a mixture of mucus and blood of a chocolate or "anchovy sauce" colour.

Pain and tenderness of localized areas of the abdomen corresponding to the affected portions of the large bowel are also prominent symptoms. The cæcum, the junction of the descending colon with the sigmoid, and the flexures are the favourite sites of ulceration. The pain and tenderness may be such that appendicitis, cholecystitis, or peptic ulcer is almost perfectly simulated.

The temperature is seldom elevated except in advanced cases and those which have developed hepatitis. Emaciation, as a rule, is progressive, although some patients remain in a surprisingly good condition and insist on continuing their usual activities until an advanced stage of the disease is reached. The white cell count is usually normal, but may be raised to 10,000 to 12,000 in some instances. A higher degree of leucocytosis in a frank case of amœbic dysentery usually heralds the onset of amœbic hepatitis.

Diagnosis.—The diagnosis of acute amœbic dysentery may be made in three ways; *viz.*, by the identification of the amœba on microscopic examination, by the symptomatology and the macroscopic appearance of the stool, or by the therapeutic test with emetine. The last two methods of diagnosis, however, should only be used in special circumstances.

The one indispensable factor in the microscopic diagnosis of *E. histolytica* in a fresh stool smear from a case of acute amœbic dysentery is the presence of an amœba which exhibits active movement while at body temperature and contains ingested red corpuscles. Active amœbæ from stools which have been allowed to cool to room temperature, especially in temperate climates, are usually not *E. histolytica.* The stool must therefore be absolutely fresh; it should be passed at the physician's office, or if the patient is confined to his house the microscope should be taken there and used at the bedside. *Entamœba histolytica* is recognized as a colourless body, three to five times the size of a red corpuscle, it manifests definite amœboid movement, and contains one or more red cells which roll about in the interior of the amœba as it flows across the slide.

> The technique of examination is as follows. The necessary apparatus consists of a microscope fitted with a 1/6-inch objective, an ordinary glass slide and coverslip, and a wooden applicator. The specimen must be collected in a dry container devoid of disinfectant or urine. A small piece of blood-streaked mucus is extracted with the applicator, smeared on the slide, the coverslip is applied and pressed firmly down, and the smear is then immediately examined.

The onset of acute diarrhœa in a person residing in a region where amœbiasis is epidemic may be considered presumptive evidence of *E. histolytica* infection. If the condition is not relieved by catharsis, and the typical macro-

scopic appearance of the stool is present, immediate institution of emetine therapy is justified, even if microscopic examination has already been found negative, or if for any reason it cannot be made at once. This course was followed by the English forces in the Mediterranean during the late war, *i.e.*, emetine was begun while waiting for the laboratory report.[3]

The therapeutic test with emetine is a necessary adjunct of the above and need not be considered further. It is of particular value in obscure cases of amœbic hepatitis, when, as often happens, the amœbæ cannot be demonstrated even on the most exhaustive examination. If the temperature and leucocytosis in one of these cases are lowered following emetine therapy the trouble can usually be considered of amœbic origin.

Treatment.—The patient should be confined to bed and kept on a liquid diet until the acute stage of the disease is passed. No red meat, alcohol, or starchy food should be taken for one month following the termination of treatment. Daily hypodermic injections of emetine hydrochloride must be commenced immediately the diagnosis is made. Bismuth subnitrate, which has a valuable astringent action in this disease, should be given in massive doses three to five times a day. Opium can be given in moderation if much pain or tenesmus is present. With such treatment the acute symptoms should be controlled in from three to five days, and sometimes earlier. More drastic measures, such as wide-open cæcostomy or appendicostomy, with bowel irrigation, should not, in my opinion, be attempted until emetine has been given a fair trial. As a matter of fact, I have never seen an acute case of amœbic dysentery which did not respond to this drug, so my experience with other methods is limited. It must be admitted, however, that emetine, although it relieves the acute symptoms and so saves life, unfortunately rarely cures. Some follow-up treatment with yatren or with one of the arsenicals is therefore necessary in almost every instance. This should be begun on the cessation of acute symptoms or when the course of emetine is terminated, and be repeated whenever the amœbæ reappear in the stool.

CHRONIC AMŒBIASIS

Signs and symptoms.—This stage of the disease, in the variety of its symptoms, may simulate almost any gastrointestinal ailment common to either temperate or tropical climates. Acute exacerbations, characterized by the frequent passage of painful, blood-streaked stools, may occur at any time, and are predisposed to by physical exhaustion, alcoholic or dietetic excess, and over-exposure to cold. These acute attacks should be classed and treated as cases of acute amœbic dysentery. As a rule, however, these patients do not particularly complain of diarrhœa, and when it is present it usually alternates with periods of constipation.

Excessive flatulence and other symptoms of chronic dyspepsia are common. Pain and tenderness of localized areas of the abdomen, and palpable thickening of the cæcum and sigmoid are other fairly constant features. Neurasthenia, loss of weight, and other indefinite symptoms are sometimes complained of by these patients.

On the whole the symptomatology is unsatisfactory, and if intestinal amœbiasis is not kept in mind the diagnosis may easily be missed. As in the acute variety, appendicitis, cholecystitis, and peptic ulcer enter into the differential diagnosis, and if there has been much tissue hyperplasia about a localized site of chronic ulceration, malignant tumour of the bowel or rectum may be confusing. Such tumours commonly occur at the junction of the descending colon with the sigmoid, where they may be felt as fusiform swellings the size of a hen's egg.

With the onset of hepatitis, a complication not infrequently encountered in untreated chronic or acute cases, the symptoms become more definite. Severe pain is felt over the entire hepatic area and is often referred to the right shoulder. The liver is enlarged and its lower margin extremely tender. Signs of involvement of the right lung base are sometimes present. Low-grade pyrexia, a definite leucocytosis, and symptoms of toxæmia are constant features. A description of liver abscess is outside the scope of this article; in brief, its onset is marked by chills, a leucocytosis of 15,000 to 25,000 (with not more than 80 per cent of polymorphonuclears), and by an exaggeration of all the signs and symptoms of amœbic hepatitis.

Diagnosis.—Except in the case of amœbic hepatitis which may be recognized by the thera-

peutic test with emetine, the only certain method of diagnosis is by the detection of *E. histolytica,* either in the stool or in the scrapings obtained at sigmoidoscopy. The search may entail many exhaustive examinations before it is rewarded, and for this reason hospital investigation is usually to be preferred for these cases. Once diagnosed, and while undergoing treatment, however, these patients may resume their normal activities, except when emetine is prescribed, in which case they should remain in bed until the course is terminated.

The laboratory diagnosis of chronic *E. histolytica* infections may be made by using three types of preparations—fresh stool smears, iodine smears, and hæmatoxylin-stained smears. Each of these is of value in identifying the cystic stage of the amœba. The hæmatoxylin-stained smear, however, is the only satisfactory method of identifying pre-cysts and those motile amœbæ which do not contain ingested red corpuscles. As the cyst is the predominating form in the stools of most cases of chronic amœbiasis (unless saline catharsis has been employed), a few remarks on its more important characteristics may be of interest. In fresh stool smears, by which method *E. histolytica* cysts can be recognized in over 90 per cent of the cases, the diagnosis hinges on the presence of the typical chromatoid bodies. These, with the proper illumination, appear as highly refractile, cylindrical bars with blunt (but not splintered) ends. These chromatoid bodies are of such diagnostic importance that their presence will accurately differentiate the cystic forms of *E. histolytica* not only from the cysts of the non-pathogenic amœbæ but also from such confusing objects as *Blastocystis hominis,* food particles, and oil and air bubbles. They are not present in every *E. histolytica* cyst in a given smear;* if they are absent in all, which occasionally happens, an iodine-stained preparation should be made. This method will bring out the two pairs of small, excentrically-placed nuclei, a number and arrangement which is another point of differentiation. If any doubt still remains about the identity of the cyst one should resort to a hæmatoxylin-stained smear. This rather elaborate method of staining will reveal not only the chromatoid bodies and the arrangement of the nuclei in the cyst but also the minute details of nuclear structure. Hæmatoxylin staining is of most value, however, in identifying precystic forms and those motile amœbæ which do not contain ingested red cells. As a matter of fact, these last two forms cannot be satisfactorily identified, except perhaps by experts, in any other way than by their nuclear structure, and if they are the only ones present in a stool hæmatoxylin-stained smears should always be used.

Summarizing, then, fresh stool smears are satisfactory for the diagnosis of active amœbæ which contain ingested red cells (acute amœbic dysentery), and of cysts which possess typical chromatoid bodies; iodine smears are useful in the diagnosis of those rare cases in which the cysts do not contain chromatoid bodies; and, finally, hæmatoxylin-stained smears are essential for the identification of precystic forms and those motile amœbæ which do not contain ingested red cells. With such a routine, an accurate differentiation of *E. histolytica* from the non-pathogenic *E. coli, E. nana, I. butschlii,* and *D. fragilis* can always be made.

The technique of preparation of the three types of smears is as follows:

A fresh stool smear is made by emulsifying a small quantity of fæces with a drop of normal saline on a slide and then applying a coverslip. The saline should be made from freshly distilled water. The smear should be so thin that newsprint can be read through it.

Iodine smears are prepared in a similar manner, using double-strength Gram's iodine in place of the normal saline. The iodine should be allowed to act for ten minutes before the smear is examined.

Hæmatoxylin-stained smears can be prepared in many ways, but the following method, which was shown me by Dr. H. H. Anderson of the University of California, has been found to be simpler in its execution than most methods described in text-books.

A thin smear is made on a slide which is then plunged immediately into the fixing fluid, preferably Schaudinn's. The slide must not be allowed to become dry at any stage of the process. The various steps are as follows: (1) Schaudinn's fluid, heated to 60° C., 2 minutes (saturated solution of corrosive sublimate in 0.85 per cent saline—2 parts; absolute alcohol—1 part; glacial acetic acid—a few drops); (2) iodine alcohol (70 per cent alcohol plus a few drops of tincture of iodine), 5 minutes; (3) 70 per cent alcohol, 2 minutes; (4) 50 per cent alcohol, 2 minutes; (5) water, 2 minutes; (6) 4 per cent iron alum heated to 30° C., 2 minutes (ferric ammonium sulphate, violet crystals only—4 grams; distilled water—100 c.cm.); (7) rinse well in water, 3 minutes; (8) 0.5 per cent iron hæmatoxylin heated to 30° C., 6 minutes (10 grams of American hæmatoxylin (white crystals) in 90 c.cm. of 95 per cent alcohol. Dilute 1 in 20 with distilled water and allow to ripen); (9) wash in water, 2 minutes; (10) differentiate in 2 per cent iron alum (cold), watch-

* A survey which is now being made of the school children and kitchen helpers of the El Centro district of this concession has so far revealed a total *E. histolytica* infection in over 23 per cent. Nineteen of the positive cases showed cystic forms in either fresh or hæmatoxylin-stained smears, and in eighteen of these typical chromatoid bodies were seen.

ing the slide under the microscope from time to time; (11) rinse well in running water, 5 minutes; (12) 50 per cent alcohol, 1 minute; (13) 70 per cent alcohol, 1 minute; (14) 95 per cent alcohol, 5 minutes; (15) absolute alcohol, 5 minutes; (16) xylol (2 changes), 1 minute each; (17) mount in Canada balsam under a coverslip and dry in the oven.

In securing a stool for examination, a natural movement is best, but a mild laxative, such as alophen or cascara, may be given if constipation is present. The first semi-soft stool following saline catharsis often contains cysts, and may therefore be used for diagnosis; later watery movements are unsatisfactory, as the cysts have all been washed away from the lower bowel and precysts and motile amœbæ, which are diagnosed with more difficulty, appear. Further, these watery stools are useless for hæmatoxylin staining as they invariably wash off the slide during fixation. Saline catharsis, however, may be decidedly useful in those cases of slight infections in which natural stools give persistently negative results. As a result of the violent purgation the stools of such cases will sometimes contain a few precysts or motile amœbæ. The identity of these forms cannot, of course, be definitely established at this time, but, later, an exhaustive search can be made for cysts which now we can be sure will appear eventually in the stool. Finally, sigmoidoscopy, with the microscopic examination of the scrapings obtained from the base of ulcers found in the rectum or sigmoid, may be useful in the diagnosis of obscure cases.

Treatment.—The diet is important and should not include red meat, alcohol, or starchy food during treatment or for one month following its termination. If amœbic hepatitis is present, daily injections of emetine hydrochloride are always indicated. Cases which show definite signs of bowel irritation are also best treated with a preliminary course of emetine. This may take the form of emetine hydrochloride injections or emetine-bismuth-iodide may be given by mouth. Daily instillations of yatren solution into the bowel are useful in those cases which are receiving emetine-bismuth-iodide. Follow-up treatment with yatren or with one of the arsenicals is usually necessary after either form of emetine therapy. This may be commenced after a rest period of one or two weeks. For milder cases, yatren (with or without long courses of bismuth subnitrate), and carbarsone or stovarsol, are usually sufficient. Patients receiving these drugs can safely continue their usual work. Periodic stool examinations should be made after each course of treatment, and a cure should not be claimed until at least seven consecutive daily examinations have been found to be negative.

E. histolytica CYST-PASSERS

Because these people do not complain of symptoms, it by no means follows that they are free from pathological lesions. *E. histolytica* lives at the expense of its host, and therefore some degree of ulceration of the intestinal mucous membrane is always present. The ulcers may have far-reaching and even fatal consequences. They may rupture a blood vessel and cause severe intestinal hæmorrhage; they may burrow through the bowel wall and produce perforation; the amœbæ may be carried to the liver, *via* the portal circulation, and set up an amœbic hepatitis or liver abscess. It is hard to imagine how such serious complications can suddenly develop in those who have never complained of symptoms, but it is a matter of record that they do.

The infection in these cyst-passers, then, is always dangerous and should be treated as soon as it is discovered. It is, however, of far greater danger to the rest of the community than to the cyst-passer himself. When present in a food-handler, especially if he is careless in his personal hygiene, the infection may be passed on to many others. Cyst-passers, therefore, are of special interest to the public health officer, and if an epidemic of acute amœbic dysentery develops in a community they should be sought and forced either to undergo treatment or to change their work.

Diagnosis. — In the conduct of a protozoal survey, which is the most practical method of diagnosing these symptom-free cases, the preparation of hæmatoxylin-stained slides will be found to be of great service. Immediate fixation in Schaudinn's fluid and subsequent passage through 95 per cent alcohol into 70 per cent alcohol are done at the point of delivery of the specimen, and the slides are then sent immersed in the last solution to the central laboratory, where staining is completed and the microscopic examination made. This method has been described in detail by James,[4] who considers it of great value in field work.

Treatment.—With the exception of emetine, the various drugs in use for the treatment of chronic amœbiasis are indicated. Following one or more courses of yatren or one of the arsenicals, the stool should be carefully watched for a reappearance of the parasite.

Miscellaneous Data on Amœbicidal Drugs

Emetine hydrochloride is given by subcutaneous injection in 1 grain daily doses for eight or ten consecutive days. During the course of its administration the patient should remain in bed. The toxic symptoms of overdosage or idiosyncrasy are asthenia, emaciation, mental depression, neuritis, a soft and irregular pulse, and changes in the skin and nails. Actually, emetine does not appear to be nearly as toxic as current reports would have one believe, and in the course of many hundreds of injections I have only seen one patient who definitely appeared to suffer from its use. This individual developed a beri-beri-like polyneuritis of both lower extremities which only disappeared after a prolonged stay in hospital. Minor symptoms of emetine toxicity, such as weakness and depression, are fairly common, but if the patient is kept at rest during the administration of the drug there does not seem to be any definite contraindication to its use.

Emetine-bismuth-iodide is always administered orally. It should be dispensed in gelatin capsules, as keratin-coated tablets are not properly absorbed. The dose for adults is 3 grains daily for ten or twelve consecutive days, but the first two doses may be reduced to 1 and 2 grains respectively. The drug should always be given at night, four hours after the last meal. Vomiting and some degree of diarrhœa are indications that the contents of the capsules are being properly absorbed, but the former may be lessened by giving 10 to 15 min. of Tinct. Opii half an hour before the evening dose. As with emetine hydrochloride, the patient should remain in bed while the drug is being given.

Bismuth subnitrate, after the method of James and Deeks[5] is administered in heaping teaspoonful doses (about 180 grains) well mixed in a glass of water, soda water, or milk, three to five times a day, over a period of from one to three months. Toxic symptoms occasionally develop but these are said to be due to impure bismuth. Recently I have observed severe cyanosis and dyspnœa in two young infants who had received large doses (about 40 grains) of a supposedly pure product, and it appears that the formation and absorption of nitrous acid in the large bowel may sometimes be the underlying cause of these alarming symptoms. Regardless of their etiology, however, they rapidly disappear following prompt purgation with magnesium sulphate.

Yatren is usually given by mouth, but may be used as a rectal installation in combination with emetine-bismuth-iodide. Orally it may be given in doses of one to four pills (of 0.25 gram each), three times a day, for seven to fifteen consecutive days. Annoying diarrhœa is the only evidence of intolerance to yatren, and its dosage should be governed by the severity of this symptom. As a matter of fact, chronically-constipated individuals are almost the only ones who can tolerate more than six pills of yatren a day in comfort. When given by bowel, a cleansing enema of 2 per cent sodium bicarbonate solution should be injected first. An hour later, 200 c.c. of a warm, 2.5 per cent solution of yatren is introduced and retained as long as possible. The instillation may be repeated each morning for ten consecutive days.

Stovarsol (acetarsone, paroxil, spirocid) is given by mouth in doses of two tablets (of 0.25 gram each) daily, or one tablet, morning and night, for one week. After a rest of seven days the same course is repeated. Toxic symptoms are those of arsenic generally, and usually take the form of an erythema. This drug should not be used in the presence of renal or hepatic disease. Carbarsone, which, experimentally, is less toxic but more amœbicidal than stovarsol, is given in doses of one capsule (of 0.25 gram), morning and night, for ten days. As with stovarsol, it should not be used when renal or hepatic disease is present.

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MYASTHENIA GRAVIS, WITH THE REPORT OF A CASE

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MYASTHENIA gravis is by no means a new clinical entity, but until recently it has been distinctly in the category of the rare and little understood diseases. Within the last year or two, however, there has been considerable discussion of this condition and as a result several cases have been added to the small list of those already reported.

Myasthenia gravis may be defined as a progressive disease characterized by marked weakness and fatigability of the voluntary muscles, induced by exercise and other factors. The primary etiology of the disease is not known. It is, however, not a nervous dystrophy.

Clinical features.—The first symptom to be noticed is generalized fatigue, particularly at the end of the day, although some few patients have difficulty on arising, which is followed soon by a period of normality, only to be succeeded by the usual marked depression in the late hours of the day. The muscles of the face and particularly those of expression are almost always the first to be involved. An analysis of a series of 20 cases[1] showed 35 per cent of the patients to localize their initial symptoms in dysfunction of the eye, while 30 per cent gave a history of having difficulty first in talking and swallowing. The symptoms however, in some instances appear first in the extremities. Perhaps it is because the eyelids play such an obvious part in human expression, that the ptosis of the lids exhibited by these patients is almost the first change commented on by their friends. Double vision and blurring of vision, induced by dysfunction of the muscles of the eye, is often the first symptom that the patient himself is conscious of.

The other muscles of expression participating in the paresis are principally those around the mouth, and of these the risorius is chiefly involved. The patient as a consequence of this muscular dystrophy loses the power of drawing the lips back into a natural smile. He may even be unable to whistle. The orbicularis oculi is often affected so that frowning and squinting up the eyes is difficult or impossible. This generalized muscular involvement naturally imparts an expression of dull listlessness to the face.

Difficulty with deglutition is the next important symptom complained of. At first the patient has difficulty only in swallowing liquids, but as the muscles involved become progressively weaker even soft foods are swallowed with difficulty. He learns early to avoid liquids, because of the distressing fashion in which they regurgitate upwards through the nose past the relaxed soft palate, and later when soft foods give trouble he eats as little as possible, so that he may even lose weight. Otherwise loss of weight is not a noticeable feature of this condition. Indeed, most patients have been described as well nourished and well preserved. There is incidentally no wasting of any muscles.

Dysfunction of the muscles of phonation is a common symptom, which manifests itself by imparting to the voice a characteristic nasal slurring twang, resembling somewhat that of a person with a cleft palate. This seems to be due largely to a poorly functioning, atonic, soft palate. The muscles of mastication have been noticed to tire very easily, so that chewing a piece of steak, for example, cannot be completed satisfactorily after a few vigorous efforts. Later in the disease it is noticed that exercise produces a very rapid fatigue in the muscles of the extremities. The arms are more frequently involved than the legs. The extremities become progressively weak and easily fatigued, to the point of almost complete paralysis if they are subjected to any unusual exertion, so that the patients go about life tripping over carpets, falling down stairs, and the like, and are continually dropping even the lightest of objects from the hands. Some patients who have the symptoms most marked in the legs are often unable to walk more than the distance of a few blocks. If walking is persisted in beyond the patient's individual limit, the legs very rapidly tire, and in some instances are even unable to support the body weight until rest affords a small amount of return toward normal. This

weakness may reach the bizarre limits of preventing the patient from turning over in bed or even of voluntarily turning the head on the pillow.

Exercise of the muscles is the predominating factor in inducing the symptoms of exhaustion, but many other factors exaggerate the manifestations of the disease. Any acute infection, such as a cold, will produce a well marked temporary regression. Indeed, the association in the patient's mind of the onset of symptoms with an acute infection has led Boothby[2] to surmise that perhaps the infection was the initial cause of the disease. However, it seems reasonable to assume that the acute infection could lower the slightly impaired muscular function to the point where it would first be noticed. Depressing drugs, strong sunlight, extremes of either heat or cold, all have noticeably detrimental effects. The depressing effect of a menstrual period is complained of by all female sufferers from the disease. Mental excitement is a common contributory factor to the muscular demoralization seen here. The nervousness induced by public contact, or the mental strain of an ordinary social gathering such as a dinner party, will often precipitate an exacerbation of symptoms which may necessitate having the patient carried from the table.

It is characteristic of the disease that, although it is progressive, it has marked spontaneous remissions. Another feature is the marked variance in rate at which the symptoms progress in various individuals. In some there is a fulminating progression terminating in death in a few months, but in most the progression is slow, extending over a period of years.

Incidentally, almost every patient in the search for relief has had the condition erroneously diagnosed in its early stages as almost every disease, from a "slight stroke" to neurasthenia. The bizarre array of symptoms make the latter diagnosis explainable.

Pathological anatomy.—Little is known of the pathological anatomy. There is no demonstrable involvement of the nervous system. In one small series of cases[3] which came to post-mortem examination, 50 per cent were found to have more or less of a persisting thymus, and in one case there was a malignancy of that organ. It has been shown however by more recent study[4] that this is not a consistent finding. There is no gross shrinkage of the muscles. There is no recorded gross or microscopic examination of the adrenal glands.

Physiology.—There is a very striking lack of helpful leads to be obtained from the ordinary routine laboratory examination. The blood elements, including creatine and creatinine are normal, but it is by the laboratory however, that the diagnosis is clinched, for the total 24 hour urinary creatinine output is diminished and in some cases very markedly so. On attempting to follow through the physiology of muscular contraction, one is immediately struck by the small amount of exact knowledge existing on that subject. It is, however, well known that muscular contraction is closely knit with the metabolism of creatine. Creatine phosphate breaks down into creatine phosphoric acid in the muscle, thereby supplying the energy of contraction. It has been shown moreover, in experimental animals at least, that the muscle is able to resynthesize creatine phosphate during rest, in the presence of oxygen.[5]

In attempting to explain the etiology of this interesting disease the conjecture is offered at this point, that perhaps these patients lose the ability to resynthesize creatine phosphate and thereby have their depots in the muscle depleted of this form of potential energy. Just why ephedrine should help these patients is hard to explain, but since creatine metabolism is controlled like so many other reactions through the liver, and since adrenalin is Nature's liberator of muscular energy through the liver by virtue of its capacity to mobilize sugar, it is possible that there is a similarity between the protein element of muscular energy and that of the sugar element, and that the fundamental seat of the trouble is in the adrenal glands. Another interesting fact is that creatine is very abundant in striated muscle, while the content of involuntary muscle is normally low.[9] This probably explains the fortunate circumstance of the muscular fatigue being confined to the skeletal system and its virtual absence in the vital structures operated by the non-striated muscles.

Treatment.—The first essential of treatment is rest, and avoidance of all the many factors which are shown by the patient's history to exaggerate the abnormal fatigue. Ephedrine sulphate acts almost as a specific for most patients. The dose of ⅜ gr., b.i.d., is sufficient to carry

the average person through the strain of an ordinary day, while the dose may be increased at times in anticipation of any unusual physical or mental tax on the patient's strength, such as, a cold, a menstrual period, or a fatiguing mental experience. The effect of this drug, however, on normal persons shows a wide individual variance on such measurable features as the blood pressure, for instance. This would suggest that perhaps trial and error would finally establish an optimum dose for each patient. Dr. Harriet Edgeworth, herself a sufferer from the disease, warns against too large a dose, for as she states, large doses of ephedrine produce a temporary marked increase in strength, only to be followed in two or three weeks by a serious regression.[6] Adrenalin on the other hand is notoriously ineffective as a therapeutic agent in spite of its close relationship to ephedrine. Ephedrine itself, although it acts beneficially on most patients, does not seem to help others, and it has been reported as being apparently harmful to at least one.[2] All of these recently discovered facts only add to the mystery of this interesting disease.

The amino-acid glycine, known also as glycocol or amino-acetic acid, has been used recently with some success in the treatment of progressive muscular dystrophy, and, being tried empirically in the case of myasthenia gravis, it has been found to produce a marked improvement in most patients to whom it has been administered. It is given either alone or in conjunction with ephedrine. The dose is 15 grm. twice daily, and since glycine constitutes 25 per cent of the total of ordinary gelatine, the drug could be given, theoretically at least, in this readily available form. The effect varies with the individual. Some few do not appear to respond well to it, but the great majority derive very material benefit from its use, and recently certain clinical trials[2] would seem to show that the beforementioned dose may be reduced gradually until a point is reached when a return of the patient's weakness warns that a minimum has been reached. Unlike ephedrine, no ill effects are reported from the drug. Its high cost, however, makes it necessary by clinical trial to determine the smallest possible dose necessary to maintain body efficiency. The present day problem is to determine the minimum dose of glycine and ephedrine, both separately and in combination. It seems that ephedrine given fifteen minutes before glycocol augments the effect of both. Irradiation of the thymus has been tried, with questionable results, where there is a demonstrable enlargement of that gland. So far as is known, extract of suprarenal cortex has not been tried.

Prognosis.—Although the disease has remissions, and perhaps even intermissions, it is on the whole definitely progressive, but the improvement is generally slow and constant under the therapy just mentioned. There is a difference in the rate of progression differing with each individual, and, very broadly speaking, the hope of improvement and of a return to normal is brightest in these patients where progress of the disease has been slowest.

The report of a case follows.

Miss E.K., aged 34.

Past illnesses.—She had had measles and whooping cough as a child (no scarlet fever or diphtheria). There was an attack of "rheumatism" at the age of 18, which lasted for a week or two and disappeared; pneumonia at the age of twenty-one. At the age of twenty-one there was a thyroidectomy with complete symptomatic relief. The basal metabolic rate, taken one month ago, was normal.

She stated that she grew rapidly until the age of 9, and then stopped growing with the onset of menstruation, which occurred at that age. She had been in poor health for the past five years.

Present illness.—As nearly as can be determined her present illness began about the age of 10 years, soon after the onset of menstruation, with symptoms of fatigue. She could not help around the house. She remembers frequently being scolded for what was considered to be malingering at dish washing, ironing, etc., and that excitement made her worse. She was troubled a great deal with epistaxis at the time, and, although the bleeding was profuse, her attendants commented that it was not severe enough to cause the two or three days' exhaustion which usually followed it. She remembers that the excitement of a football game would make her worse for a week following. The mental strain of attending school would affect her so that she was forced to leave school for about the last six weeks of each term. In spite of that fact she was always advanced in her studies, and at least a year ahead of the children of her age.

Her major symptoms began about five years before, with diplopia. This induced her to consult an oculist, who noticed that she had also a bilateral ptosis of both lids. The lids had to be held up so that she could have the eyes refracted. There had been considerable difficulty since that time with her vision, and she volunteered the information that the longer she tried to focus, the more difficulty there was in seeing clearly. Within the last five years she had had several refractions done, and she stated that her vision had varied at each examination, and even very considerably during the course of one day.

Shortly after the onset of diplopia she began to have difficulty in swallowing. This was slight at first, but the dysphagia increased to the point of almost complete inability to swallow liquids without having them regurgitate through the nose. Later there had been times when the difficulty was so great that she avoided even soft foods. During these times she had lost some weight.

Some time after the onset of dysphagia she began to notice that her extremities were unusually weak. This was more marked in the arms than in the legs. These symptoms of weakness had increased in severity to the point where she was often unable to carry the lightest of parcels without dropping them, in spite of great conscious effort not to do so. She stated that at times when she was beating time before a class of school children she was utterly unable to continue to the end of the song because of the muscular weakness induced by the exercise.

Within the past year the weakness became so extreme that at times she had been unable to put on a dress without lying down on the bed in order first to get the garment over her head. Brushing the hair at these times had been difficult, and sometimes impossible, after several strokes of the brush. There had been, at various times, weakness in the legs, which caused her to stumble when going up and down stairs. She had had to be supported by friends when returning from a hike.

From an early period in her illness the muscles of expression had been involved. Her friends noticed that her face had a set look. Ptosis of both eyes has been mentioned before. She no longer smiled normally, but drew the corner of the mouth up toward the nose in a peculiar sneering grin. She could no longer whistle. She mentioned also that she could keep her mouth closed only with difficulty, and not at all when she was asleep, so that when lying on her side saliva drooled out of her mouth. The muscles of phonation were involved, to the extent that she talked at times with the nasal cleft-palate twang characteristic of patients with post-diphtheritic paralysis of the soft palate. It was noticed that she preceded every sentence with an audible click of the tongue against the roof of the mouth, which seems to have been an unconscious effort to mobilize the relaxed soft palate before speaking.

All of these symptoms have shown exacerbations and remissions, even intermissions. She noticed that she felt fairly well in the mornings and was always worse at the end of the day. Mental strain was quite as potent a causative factor as physical effort. Her worst time was during the year that she acquired a university degree in addition to attending to her occupation of school teaching. Extremes of either heat or cold were depressing. All of her symptoms were markedly exaggerated during the prodromal phase of a menstrual period and during the first few days of menstrual flow.

Family history.—Father, mother, and brothers are all living and well. There was no history of menstrual precocity in any member of the family beside herself.

Examination.—The patient was a well developed, well nourished white female of northern European stock. She looked about her stated age. She was short and stocky, her height being 4 feet 10, and weight 103 lbs. Her appetite was good. She slept well. Her habits were normal. She lives quietly at the present time, although during the past 3 or 4 years she had been working hard at her profession with overtime hours, in addition to acquiring a university degree by attending night classes.

There was a bilateral ptosis of both lids, more marked on the right. When she was asked to close her eyes, the right lids did not meet. There was almost complete loss of ability to forcibly close the eyes in a squint, or to frown. The conjunctivæ, scleræ, and corneæ were normal. The pupils reacted to both accommodation and light. The eye grounds were not examined. Unaided vision, 50 per cent of normal. Right eye (with glasses), 68 per cent of normal; left eye (with glasses), 75 per cent of normal. She stated that intense effort to read made the letters jump. The glasses have been changed four or five times in the last five years.

This was a history of epistaxis. The nose was essentially negative beyond a slight deviation of the septum. Hearing was normal in both ears (watch test). The throat was clear; the teeth were in good order.

The pulse was normal in rate, rhythm, volume, and tension. Blood pressure was 100/60; it was 105/70 one-half hour after 3/8 gr. of ephedrine by mouth. Hæmoglobin, 75 per cent; red cells, 5,100,000; white cells, 6,200. The Wassermann test was negative. The heart was not enlarged to percussion. There was a loud blowing systolic murmur at the apex, transmitted into the axilla.

Her chest was well developed, with free respiratory excursion. The lungs were clear both on general and x-ray examination. The appetite was good. There was a daily bowel movement. Physical examination revealed no abnormalities.

There have been occasional attacks of frequency of urination. These were associated in her mind with "a cold". The frequency at these times is: day, 12 to 15 times; night, 2 to 3 times. She thought that there was blood in the urine on one or two occasions, several years ago. There had never been dysuria. There was no tenderness over the anterior or posterior kidney point, or along the ureter or in the bladder region. The kidneys were not palpable.

Urine examination: urine of a clear amber colour; specific gravity, 1.022; acid; no albumin; no sugar. Microscopic examination was normal, beyond a few leucocytes. A 24-hour specimen shows the creatinine excretion to be 0.52 grm.

Genital system: menstruation began at the age of 9. The pubic hair and breasts developed at that time. After its onset, menstruation occurred regularly every 28 days and lasted for 3 to 5 days. There was a normal amount of flow and no dysmenorrhœa at any time. This continued until the age of 20, when she began to have menorrhagia. The periods occurred about every 20 to 25 days, lasting 8 to 12 days. This state persisted until about a year ago, when the menstrual dysfunction returned rather suddenly to normal. For the last year the periods have occurred every 28 days, and have lasted for three days.

Examination of the genitals shows nothing of special note.

COMMENTS

In reviewing the history and symptoms of this patient, and on attempting to explain some of the unusual facts presented, attention is immediately directed to two important structures, namely, the thymus and the adrenals. Investigation of the known and partly known action of these glands discloses certain interesting and perhaps relevant facts. The cortex of the adrenal gland takes its origin from structures quite different from those of the medulla. It arises from embryological tissue identical with that of the gonads. Its proportion to the medulla is as 9 : 1, and it is much more essential in the maintenance of life than the medulla. In the phylogenetic scale, the cortex of the adrenal is seen to increase in size with the development of the cerebral cortex, and the functions of the two, in one sense, are analogous. Adrenalin, which is manufactured by the medulla of the adrenals, supplies aggressiveness to the individual, but this vegetative action is tempered by the psychic activity of the cerebral cortex. Experimental work[7] seems to show

that the action of the cortex of the adrenal is also antagonistic to the medulla. The adrenal medulla, by the action of its adrenalin mobilizes sugar and maintains smooth muscle tone. The cortex may mobilize the protein element, creatine, so essential to the function of the striated muscle system. The antagonistic before-mentioned action may explain why excitement is so deleterious to patients with myasthenia gravis, on the basis that the amount of adrenalin manufactured under the circumstances, in some way neutralizes the action of the substance from the already weakened cortex.

In known cortical disease, certain facts have been noticed. First, females show certain male characteristics, namely, male distribution of pubic hair, hair on the chest, beards, and even a general hypertrichosis. There is also a low blood pressure similar to that induced by the action of ovarian and testicular extracts.[8] The patient showed these signs.

In conclusion, it is interesting to note that five weeks after the institution of ephedrine therapy alone, (3/8 gr. b.i.d.) this patient is showing a dramatic improvement. Her capacity to swallow liquids has returned so that she has now embarked on an orgy of ice cream soda drinking, which has been denied her for several years. Her speech is improved. Her smile is normal. She states that she no longer feels fatigued after a usual day's work. She recently appeared in an amateur theatrical production, and confidently states that this would have been utterly impossible prior to the institution of this therapy.

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PULMONARY ATELECTASIS RESULTING FROM HÆMOPTYSIS

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IT is entirely likely that pulmonary atelectasis occurs as a result of hæmoptysis more frequently than the few cases reported in the literature would suggest. When such a case is seen for the first time after the occurrence of the collapse, the condition may readily be mistaken, as in Rosenblatt's case, for a pulmonary fibrosis of long-standing, and pulmonary collapse of only a few days' duration, as in Wilson's case, might conceivably pass unobserved.

The prognosis in such cases has a definite bearing on treatment. One would like to know whether or not all these cases of atelectasis due to hæmoptysis re-expand spontaneously; and how long the lung may remain collapsed and still be capable of re-expansion, once the bronchial obstruction is removed; and whether, again, in these cases there is, as suggested by Saye, any real danger of pneumonia.

The writer here reports an additional case of pulmonary atelectasis caused by obstruction of a bronchus by blood clot following hæmoptysis.

CASE REPORT

Audrey, aged 13.—This girl was apparently in very good health prior to the onset of the present illness. She had had whooping-cough in early childhood, but no other previous illness of any importance. She had never been in contact with a case of human tuberculosis, and, except during an occasional country holiday, had always used pasteurized milk.

On March 23, 1933, she wakened with a choking sensation about 11 p.m., got out of bed, and went to her mother, who reassured her and she went back to bed and slept till 4 a.m. when she woke again with a choking sensation and coughed up a little blood. She slept again and next morning felt as well as ever and went to school as usual.

On March 25th, she again coughed up a little blood in the morning and complained of shortness of breath, but carried on as usual.

On March 26th, she spat blood again, was definitely short of breath, and remained in bed. Examination at this time revealed some restriction of movement of the right side of the chest and moderate impairment of resonance at the right base, where the breath sounds were distant. The trachea was central, but the heart was displaced towards the right side. A few fine râles were heard at the right base anteriorly. Her temperature was 99-1/5° F. and she was slightly dyspnœic.

March 27th, signs and symptoms unchanged. Temperature normal.

March 28th, a small hæmoptysis. The expectorated blood was examined and no tubercle bacilli found, by direct smear, guinea-pig inoculation, or culture.

March 30th, dyspnœa increased markedly. X-ray showed well marked displacement of the heart to the right and atelectasis of the right lower lobe. Temperature, 100° F.

In view of the increased dyspnœa, and in fear of the presence of a non-opaque foreign body, with the attendant fear of pneumonia, it was decided to do a bronchoscopy. This was done by Dr. D. E. S. Wishart, under general anæsthesia. Numerous blood clots were aspirated through the bronchoscope, many of them in the form of blood casts of the bronchial tubes. No bleeding point was seen, but there was congestion of the mucosa of the lower right bronchus. After bronchoscopy the signs of collapse had cleared, and the dyspnœa was completely relieved. Her temperature was normal next morning and remained so.

On April 1st, a few small blood casts were expectorated. This occurred again on April 10th. On April 11th, x-ray showed the lung to be completely expanded and to present no evidence of disease.

On April 13th, an intracutaneous tuberculin test was negative to 1/20 mg. of old tuberculin.

April 15th, the intracutaneous tuberculin test was negative to 0.25 mg. of old tuberculin. She remained in bed, feeling perfectly well, till May 7th, and then was allowed up for a short time each day.

On May 12th, she had a moderately severe hæmoptysis, the examination showing only a few râles at the right base anteriorly.

On May 13th, she had repeated and very severe hæmoptyses, so that transfusion was deemed necessary as an emergency measure. The signs previously described, of collapsed right lower lobe, were observed again on this day, but dyspnœa was slight and the temperature normal. Transfusion was repeated on May 14th. X-ray on May 18th showed the triangular basal shadow of complete right lower lobe collapse.

She expectorated blood in small quantities on two or three occasions between May 14th and 20th, and each time some of this was in the form of casts of the bronchial tubes. However, on May 20th, the lower lobe was still collapsed, and on this day dyspnœa suddenly became more marked. Bronchoscopy was done for relief of dyspnœa, and because one felt there was some danger in permitting the lobe to remain atelectatic. Again only clots of blood were removed and no bleeding point was found. The lung expanded at once.

A gastric x-ray, on May 18th, had revealed no lesion of stomach or duodenum or œsophagus.

On May 25th, lipiodol was instilled to the base of the right lung. X-rays after this showed no bronchial dilatation and that the right lung was again fully expanded.

The girl remained in bed till the end of August and was allowed to return to school in November. On August 22nd, the intracutaneous tuberculin test was again negative to 0.25 mg. of old tuberculin. She has been seen at intervals since then and has remained quite well. Her heart has been carefully examined, by stethoscope and fluoroscope on several occasions and is normal. The lung remains fully expanded, and by March 19, 1934, she had gained 26 lbs.

The diagnosis remains in doubt.

DISCUSSION

A review of the readily available literature resulted in the finding of only 6 other cases of pulmonary atelectasis due to hæmoptysis. Wilson[1] reported 1 case occurring in a case of pulmonary tuberculosis. The lung re-expanded spontaneously after 3 days. Saye[2] had 2 cases, both with pulmonary tuberculosis. In one case the lung re-expanded spontaneously in about a week; in the other spontaneous re-expansion required about a month. Hennell's case,[3] also in a tuberculous patient was marked by spontaneous re-expansion after 72 hours. It is of interest that in his article he mentioned a case, reported by another, of atelectasis of "several months'" duration, which was relieved by the removal of a benign endobronchial tumour. Thus, apparently, an atelectasis of long duration is capable of re-expansion. Moersch and Berkman[4] report the interesting case of a man whose hæmoptysis they believed due to hypertension. They waited two weeks for the lung to re-expand and finally removed a blood clot bronchoscopically from the bronchial lumen. The lung re-expanded at once. Rosenblatt's case[5] was tuberculous. The lung was collapsed when first examined after hæmoptysis, and it was naturally interpreted as collapse due to long-standing fibrosis. However, the lung had completely re-expanded when examined again five weeks later.

It would seem, therefore, that pulmonary atelectasis due to hæmoptysis has a very satisfactory tendency to re-expand in from a few hours to a month, that this re-expansion is preceded by the expectoration of old blood clots in the form of casts of the bronchial tubes, and that the occurrence of pneumonia is unusual, though it must be admitted as a theoretical possibility. Therefore, treatment of these cases should be expectant as long as the temperature is normal and dyspnœa is not marked. It would appear that one may wait a month or more in such circumstances, with a reasonable expectation of obtaining complete re-expansion of the atelectatic lobe, even after this interval. If the patient becomes febrile, if dyspnœa is marked, or if the atelectasis does not clear in a month, or if the diagnosis is in doubt, bronchoscopic examination and removal of the obstructing clot is certainly indicated.

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DERMATITIS EXFOLIATIVA

(WITH REPORT OF TWO CASES)

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THE etiology of dermatitis exfoliativa is complex and the diagnosis often difficult. Two cases are recorded here which exemplify this statement.

CASE 1

A male, aged 27, married, Russian, farmer.

Personal history.—He had had no serious illnesses; no history of venereal disease of any kind. He gave no history of exposure to, nor of having been given, any of the heavy metals such as arsenic, mercury, bismuth or lead; he admitted however, having worked in a smelter for a time.

Family history.—Good.

History of present illness.—The patient stated that in March, 1934, several lesions appeared, one on his right knee, one on his buttocks, and one on the scalp, and that after applying an ointment which was ordered by his family physician, these lesions began to spread, and continued to do so until the whole skin surface was involved. This dermatitis continued without improvement for five months, at the end of which time, on August 14, 1934, he was referred to me by his family physician. The patient when examined presented a generalized exfoliative dermatitis, involving the scalp, palms and soles, the ears, and the mucous surfaces of the eyes, nose and mouth. The skin was very red and very much thickened. The scales were large and papery, and were continually being shed in large quantities. The inguinal glands were enlarged and rather soft to the touch: the posterior cervical glands were also somewhat enlarged. There was much loss of hair, and at the time of writing the finger nails were coming off. He complained of weakness, chilliness, anorexia, loss of weight, and of soreness of the eyes, mouth and nose, and of being itchy all over. At the time of examination he was using a strong tar ointment. His temperature was 101°, pulse 110. The Wassermann test was negative.

August 15, 1934.—Differential blood count: white blood cells, 14,000; polymorphonuclear cells, 72 per cent; lymphocytes, 14 per cent; large mononuclears, 2 per cent; transitionals, 2 per cent; eosinophiles, 10 per cent.

Urinalysis: nothing abnormal found.

August 27, 1934.—White blood cells, 10,000; polymorphonuclears, 62 per cent; lymphocytes, 30 per cent; transitionals, 2 per cent; eosinophiles, 6 per cent; red blood cells, 3,520,000; hæmoglobin, 87 per cent.

September 10, 1934.—Urine examined for heavy metals. A strong trace of lead was found.

September 26, 1934.—White blood cells, 10,200; polymorphonuclears, 64 per cent; lymphocytes, 18 per cent; large mononuclears, 12 per cent; eosinophiles, 6 per cent.

CASE 2

A female, aged 41, married, English, a farmer's wife.

Personal history.—She had had diseased tonsils for several years. There was no history of any serious illness until a few months ago.

Family history.—Good.

History of present illness.—In May, 1934, the patient developed a dermatosis for which she was treated by her family physician, when, after attending her for three weeks he referred her to me for examination, with the request that I send her back to the hospital in ner home town so that she would be near to her people. On examination I found her to be suffering from a generalized hæmorrhagic erythema multiforme of the iris type, the underlying cause of which in my opinion was a very septic condition of both tonsils. The entire skin surface was involved, including the face, palms, and soles of the feet. The extremities were much more severely involved than were other parts of the body, and were very red and swollen. She complained of being weak and of being generally out of sorts. Her temperature at that time was 101°; her pulse rate, 100. I treated her for two days, and then advised her to go back to the hospital near her home, to be under the care of her family physician, with the diagnosis of a very malignant type of erythema multiforme, and with instructions as to her care and treatment. I was later informed that her skin affection cleared up completely, but that she did not recover sufficient health to justify having her tonsils removed, which I had advised should be done as soon as the operation could be performed with safety. I heard no more of the patient until August 13, 1934, when I was again asked to see her at the Holy Cross Hospital, in consultation with a Calgary physician. I was told that she had been suffering from an abscess of the right lung for the past three weeks, and that about one week previous to my seeing her she had developed a generalized skin affection, for which reason I was called in consultation. I examined her and made the diagnosis of generalized dermatitis exfoliativa. The patient appeared to be very ill, and I gave it as my opinion that she had very little chance of recovery. Her skin was rather pale. There was no induration. The scales were large and exceedingly thin and of a pale, greyish colour. Her whole skin surface was involved. There was much loss of hair, and from the palms of the hands the epidermal layer was thrown off in glove-like fashion, such as is seen occasionally in a very severe case of scarlatina. Her temperature while in the hospital varied from 98 to 103°; her pulse varied from 100 to 134.

Differential blood count: white blood cells, 33,000; red blood cells, 3,550,000; hæmoglobin, 62 per cent; polymorphonuclears, 92 per cent; lymphocytes, 80 per cent. Sputum: no tubercle bacilli; long chains of streptococci, plus; pus, 3 plus. Urinalysis: epithelium; albumin, a trace.

Two cases of generalized dermatitis exfoliativa are here reported, each resulting from a different cause.

In the first case the predisposing cause was, in my opinion, lead, and the exciting cause irritating applications in the form of strong tar ointments. For three weeks under my care the patient received a bland, salt-free diet, low in proteins, with plenty of carbohydrates and abundance of alkaline drinks, such as sodium citrate and sodium bicarbonate, with no acids,

but with lots of milk and water. He was given starch baths, with applications of a mild, soothing paste three times a day. Under this treatment he improved, his temperature became lower, and his chilliness disappeared. The induration and scaling of the skin became very much less, but it was not until lead was found in the urine and sodium thiosulphate was given that a real improvement took place. Following the intravenous administration of 0.5 grm. of sodium thiosulphate the temperature has since remained normal and the patient felt much better. The induration and scaling of the skin made a more rapid improvement. At the present time, after having been given five intravenous injections of 0.5 gram of sodium thiosulphate at three days intervals, and with the continuation of the former regimen, the patient's skin and general condition have very much improved.

In the second case the dermatitis exfoliativa was in my opinion due to sensitization to bacterial toxic proteins absorbed into the system from the patient's septic tonsils and also to some extent from the abscess in the lung. The patient first developed a hæmorrhagic form of erythema multiforme, which cleared up under treatment; then two months later she developed an abscess in the lung. Three weeks later still she developed a generalized exfoliative dermatitis. It is claimed that toxæmia is generally the cause of erythema mutiforme. It is also claimed that toxæmia may at times cause dermatitis exfoliativa. We have here two different dermatoses developing in the same patient, one coming on a few weeks after the other had cleared up, both diseases said to be due in a certain percentage of cases to toxæmia, so that in all probability this patient's dermatitis was due to toxæmia. She responded well to treatment for her skin condition, but she was unable to cope with her lung affection and died on September 10, 1934.

According to present knowledge primary exfoliative dermatitis does not occur, but the condition is nearly always traceable to some underlying causative factor or preceding dermatitis. The so-called primary form is in all probability the result of a toxæmia of varying kind; it represents a symptom complex of varied origin, and includes disturbance of the vascular system, changes in the chemistry of the blood and of the skin, faulty metabolism, focal infection, endocrine dysfunction, and, probably, some other factors which are as yet not thoroughly understood.

Secondary exfoliative dermatitis includes those forms of generalized inflammation and desquamation which are preceded by psoriasis, chronic eczema, lichen planus, pityriasis rubra pilaris, etc. It also includes those cases of dermatitis exfoliativa which are set up as the result of strong applications such as chrysarobin, tar, and other irritating drugs for the treatment of such diseases. It also develops occasionally from the use of arsenic, mercury, or bismuth for the treatment of syphilis, and at times when these and other heavy metals, such as lead, are absorbed into the system in any way whatever. It may develop from any of the forms of lymphoblastoma, such as mycosis fungoides, leukæmia, Hodgkin's disease, and also from tuberculosis. Any of the forms of lymphoblastoma may start primarily in the skin. It is stated that 12 to 15 per cent of lymphoblastomas present universal exfoliation at some time in their course.

The most common clinical signs of mycosis fungoides consist of cutaneous lesions only, without visceral manifestations or alterations in the blood picture, and in most cases without any evident involvement of the lymph glands, while other forms of lymphoblastoma, such as leukæmia and Hodgkin's disease, usually begin in the internal organs and spread to the skin later; but exfoliative dermatitis may at times precede the development of any of the forms of lymphoblastoma. The disease may start in the skin and be present in the blood later; for months or even a year or two there may be itching, alone with or with eruptions, such as those of an urticarial, eczematiform or erythema multiforme-like character, or a diffuse erythroderma may occur. Exceptionally, the early eruption takes the form of a generalized exfoliative dermatitis; such cases are often very difficult to diagnose.

When a patient presents himself with a universal erythroderma or dermatitis exfoliativa the clinical features of the disease are frequently so obscured as to make definite diagnosis impossible on the basis of objective examination alone. Observation is often necessary for a long time, unless the diagnosis is made by histological examination. In view of the fact that exfoliative dermatitis may in rare instances represent an early non-specific stage or a toxic reaction of one of the types of lymphoblastoma

it is very necessary to make a searching examination so as to discover the causative factor. It may in many cases be necessary to make use of all the diagnostic methods available, including careful clinical examination, careful history-taking; x-ray, studies of the blood, especially the differential count, search for heavy metals in the urine, the hair and other tissues, and a biopsy of the skin and lymph nodes. We must consider the patient from many angles. Dermatitis is rarely the product of a single cause acting alone; the peculiarities of the skin and of the general organism must be reckoned with. The large majority of cutaneous diseases have a systemic background of predisposing causes, one or more of which contribute to the production of the trouble which is provoked by the exciting cause. The skin by order of its extent, structure and function, is the organ which very often shows manifestations that must be regarded as body reactions against harmful agents within. The living cell is influenced by external and internal stimuli, among the latter, toxins produced within the body. There are many general conditions which interfere with the nutrition or general well-being of the body and of the skin. These lower the power of resistance to external irritants. In certain conditions the blood is loaded with the products of katabolism, and as the skin next to the kidneys is the greatest excretory organ its powers of resisting irritants is lowered. There are many things which act as exciting causes, and many conditions which are predisposing causes of dermatitis. Many diseases of the skin are but a part of a general disturbance, and, again, certain conditions within the body, while not the direct cause, predispose to a diseased state. A healthy condition of the skin depends in large measure upon the healthy functioning of all the other organs of the body; when one organ is diseased or out of function every other organ of the body must suffer.

A very important factor here is the individual possibility of sensitization and desensitization. This leads to great individual variation in the course of a disease, even though the disease results from one cause only. Skin eruptions also may exemplify this fact. Certain infections and conditions of the skin result in different types and degrees of biological response, depending upon the cause and the peculiarities of the individual attacked. The state of immunity and also the susceptibility to react with disease to bacterial or non-bacterial toxic proteins must be considered. An eruption represents the reaction of the skin to some known or unknown cause; while one patient may respond with an eruption classified as erythema multiforme, another as dermatitis herpetiformis, and another as dermatitis exfoliativa, the cutaneous reaction of still another may take the form that will show some of the characters of the first and some of the others. This is very difficult to understand. There may be a combination of causes; there may be a complex of interacting factors, no single one of which may be responsible for the disease. Urticaria, erythema multiforme, dermatitis exfoliativa, and other dermatoses are at times a definite manifestation of bacterial sensitization. In such conditions a focus of infection should be sought for as a possible underlying factor in the etiology. Septic elements may be repeatedly passing into the blood stream and carried to the tissues. The result of this on the general organism and on the skin may be of slow evolution, but eventually may be an important though hidden factor in the etiology of many dermatoses.

In this attempt to describe some of the causes of dermatitis exfoliativa it may appear that I have given undue prominence to the sensitizing effect of bacterial proteins as a causative factor in the production of certain dermatoses. I am well aware, however, that there are many underlying factors other than focal infection which act as causative agents in the production of skin diseases. A large part of the reaction to infection is allergic; therefore in the consideration of dermatological diseases we must give consideration to allergy. There are few conditions met with in the practice of medicine more varied as to cause and final result, and few which are more difficult to understand or more difficult to correctly diagnose.

PRIMARY THROMBOSIS OF THE AXILLARY VEIN

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WITH regard to etiology, thrombosis of the axillary vein may be divided into three main groups. In the first group are included all those cases which are caused by known factors. These operate either within the lumen of the vein or from without. The condition then in no way differs from thrombosis of the femoral or other veins. In the second group are included cases observed in persons who are able to state that the condition developed following an accident or strain. Under such circumstances it has been customary to refer to the condition as primary thrombosis of the axillary vein caused by effort or strain. I have had occasion to observe two such cases. This type has recently been discussed in detail by Matas. On rare occasions one meets with thrombosis of the axillary vein which has developed suddenly, spontaneously, and in the absence of any accidental cause or strain. Such cases are extremely rare. At the present time they rightfully deserve not only to be differentiated from those cases which fall into the second group but also to be considered as examples of so-called primary thrombosis of the axillary vein. It is my purpose to present a case which falls into this third group.

M.S., a male, aged twenty-two, first came under my care on April 29, 1933. He was at that time concerned about his health chiefly because he had been exposed to tuberculosis. Clinical and roentgen-ray studies at this time failed to disclose any evidence of tuberculosis. His blood picture, Wassermann reaction, urine and blood pressure (120/80) were all normal. The patient who was of the athletic type was permitted to carry on as he had in the past. He was observed at intervals. From this time until the onset of the present illness he enjoyed good health, save for an uneventful attack of mumps during May, 1933.

On June 12, 1934, he developed a few superficial abscesses on the chin and left arm; none on the right arm. These were incised. Eleven days later he presented a rather alarming clinical picture. The entire right arm and hand were involved in a rapidly spreading œdema. In less than twenty-four hours the entire arm had become more than twice the size of the corresponding member. The overlying skin was tense and of cyanotic hue. The patient was afebrile. There was a striking absence of local or general manifestations of inflammation, and no tenderness, save along the course of the axillary vein, which could be palpated as a very definite cord. The regionary lymph glands were not enlarged. The venous pressure in the affected extremity appeared to be appreciably increased. The arterial circulation showed no detectable deviation from the normal. The condition present was thus typical of thrombosis of the right axillary vein.

A specimen of blood was taken for culture, but showed no growth. A cytological study of the patient's blood revealed the following (R. Gottlieb): erythrocytes, 4,800,000; hæmoglobin, 95 per cent; leucocytes, 10,100. The red blood cells were normal and well filled with hæmoglobin. The fragility was normal. The metamyelocytes numbered 2 per cent; rod nuclei, 16 per cent; polymorphonuclears, 47 per cent; eosinophiles, 3 per cent; lymphocytes, 26 per cent, and monocytes, 6 per cent. The shift was to the left. The leucocytes showed neutrophilic preponderance and hypermotility. The thrombocytes numbered 326,000 and were of normal size and shape. Bleeding and coagulation time were normal. The serum was pale. The direct van den Bergh was negative, the indirect 0.4 units.

As early as the second day of his illness there was evidence of a beginning collateral circulation, particularly marked over the right shoulder and upper half of the right chest. The affected arm was elevated and ice applied locally. Three days later the man found it necessary to return to work and did so carrying his arm in a sling. He dispensed with the sling after a few days.

Save for a rather well marked collateral circulation, the arm appeared normal when the patient was observed last on September 15, 1934. The axillary vein could no longer be palpated. A sense of fullness and tenseness still develops occasionally even after such a slight effort as shaving.* From personal contact with two somewhat similar cases of primary thrombosis of the axillary vein caused by strain I am inclined to believe that further discomfort may continue to be experienced from time to time, even over a period of years.

In this case the presence of boils previous to the development of the thrombosis may be considered by some as a complicating factor. There is no evidence that such was the case, although it must be admitted that the incision of the abscess on the left arm may have been a contributing or predisposing factor. Emphasis is laid upon this point because in the discussion of Matas' paper[1] by Gerster[2] mention is made of a somewhat similar case which occurred in a painter aged twenty-three. This man had acted as a donor for a transfusion. The blood was taken from the left arm. About four days later he suffered from thrombosis of the right axillary vein. One day following the withdrawal of a sample of blood from a vein in the left arm of my patient the condition in the right arm became accentuated. It should also be noted that Mont R. Reid,[3] in referring to the condition in

* On February 9, 1935, the patient stated that now discomfort was noted only after he exercised.

the left axillary vein of a male, aged sixty-three, makes mention of the fact that about one month previously pimples, which disappeared spontaneously, were noted on the left arm.

On several occasions thrombi have been removed from the veins of persons who developed the condition following a strain. They have nearly all proved sterile. That the condition is obviously not due to some inflammatory cause was well illustrated by the findings in the case referred to by Reid. His patient was subjected to an exploratory operation. Distended, solid, incompressible veins were encountered, but no adhesions. None of the veins were entered. The improvement which followed this procedure was considered as due possibly to the decompressing effect exerted upon the lymphatics. It is suggested that involvement of the accompanying lymphatic vessels as well as thrombosis of the vein might account for the recurrence of attacks in some cases. Other investigations, such as blood pressure and hæmatological studies, have proved inconclusive. Horton (cited by Matas), dealing with a patient suffering from primary thrombosis of the axillary vein caused by strain, made a comparative study of the oxygen content in the peripheral venous blood of both arms. A decided lowering of the oxygen content on the affected side was found. On the affected right side the oxygen saturation of the venous blood was 43 per cent as compared with 70 on the normal left side. Obviously, all conditions which may produce mechanical compression of the axillary vein must first be excluded before a diagnosis of primary thrombosis of the axillary vein is made. Complete roentgen-ray studies were made in the case here reported, and such conditions as tumour, aneurysm, fracture, cervical rib, tuberculosis and pleurisy were excluded.

The duration of disability is apparently variable, the prognosis as regards life, good. Matas urges that "a difference should be recognized medico-legally between primary thrombosis of the axillary vein caused by accidental trauma (muscular strain and indirect injury) and the so-called spontaneous thrombosis which occurs without any history of accident, antecedent injury or continued occupational strain."

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AVERTIN AS AN AUXILIARY THERAPEUTIC MEASURE IN TETANUS*

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ANÆSTHETICS have long been used in treating the convulsions of tetanus. Reports upon their various effects and uses have been published from time to time, with the more specialized development of anæsthesia within the last century. Chloroform and ether were frequently employed. Owing to the particular nature of both these drugs, their use was comparatively restricted, although very efficacious for short periods. The use of narcotics, including morphine, is limited; chloral in doses sufficiently large to control the convulsions was frequently considered too dangerous to be used. Curare was in vogue for a short time, but owing to its extreme toxicity its use was never practical, clinically. The barbiturates, particularly sodium amytal, are of much more value, as in the absence of serious organic lesions, particularly of the liver and kidneys, they can be given over a considerable length of time. Even sodium amytal, however, is not very satisfactory on account of the variability of the dose required. In the last ten years, avertin has come into widespread use in general anæsthesia, and has in fact largely superseded sodium amytal, which for a time was so popular. The results of the use of avertin are comparatively uniform, and there is a fairly wide range between the amount of the drug which will produce narcosis and the lethal dose.

* A paper read before the Montreal Medico-Chirurgical Society on November 16, 1934.

In tetanus, where death is to a large extent due to exhaustion and respiratory failure on account of the severe spasms, the use of avertin was soon introduced. The majority of the early references occur in German literature. Recently reports have become more numerous in English, French, and Italian literature, indicating the more general adoption of the procedure.

Kaspar,[1] working experimentally with rats, determined first the lethal dose of tetanus toxin. Two groups of animals were then given the lethal dose. One received avertin per rectum when convulsions developed, the other being used as a control. All of both groups died, but the avertin group lived longer than the control group, the maximum increased duration of life being slightly over four hours. From this experiment, it was concluded that avertin in itself is incapable of effecting a cure. In two other groups of animals, all received a lethal dose of tetanus toxin. Following this, the first group was given antitoxin alone, while the second group received the same dose of antitoxin, but was kept under the influence of avertin, by rectal administration. Between 3 and 4 per cent of the former group recovered and 37 per cent of the latter. Kaspar developed the distinct impression, not only from his experiments but from the reports of clinical cases, that the earlier the avertin was given, the better the prognosis.

Momburg and Rotthaus[2] report a case in a child with recovery. The infection was very severe, with a short incubation period and early manifestation of convulsions. Avertin was administered in doses controlling the convulsions, as required, over a period of 15 days. As high as 0.18 g. per kilogram was given, and during the period of treatment 63.8 g. were administered. Antitoxin was of course used in conjunction with the avertin.

Sartorius[3] reports a case of tetanus with recovery in a male of 25 years. A combined avertin and antitoxin régime was followed. Avertin was given for a period of 12 days. The symptomatic relief was so pronounced that when the effect of the avertin began to pass off the patient asked for more to relieve his pain and allow him to rest.

Sodium amytal[4] has similarly been used in the treatment of tetanus. The results are not as satisfactory, and it seems wiser to reserve this drug for the control of strychnine poisoning. Strychnine[5] and amytal are mutually antagonistic, and Barlow,[6] in an experiment on antagonism in rabbits, using varying doses of pentobarbital, was able to save rabbits which received up to thirty-five times the ordinarily lethal dose of strychnine.

The following two cases of tetanus were observed in the Children's Memorial Hospital, Montreal.

CASE 1

V.N., a male child, aged 9 years, was admitted on May 12, 1934. The complaints submitted by the father were: rigidity of the whole body; pain in the abdomen; inability to move. On May 10th the boy began to feel feverish and thirsty. At 1.30 p.m. pain commenced in the neck muscles. The whole skeletal musculature became rigid, and the same night mild convulsions occurred. On May 11th, the abdomen felt painful, which was probably due to muscular spasm. The jaw had been firmly clenched almost continuously since the onset. On admission to hospital, the spasms had been present for at least 36 hours, and for at least 20 hours previously there had been frequent generalized convulsions. The face and body were perspiring profusely, and the jaws were clenched. The child was quite conscious and rational. Most of the skeletal muscles were in extreme continuous spasm. Convulsions occurred at intervals of a few minutes, both spontaneously and upon the slightest peripheral stimulus. There was a partially healed abrasion on the right heel, which had been present for three or four weeks.

The condition was at once diagnosed as tetanus. Ether anæsthesia was given at 1.10 p.m., to allow a lumbar puncture to be performed, and at the same time avertin, 2.1 g., was given rectally. While under the anæsthetic, a sliver and the surrounding tissue were excised from the right heel, from which the bacillus of tetanus was ultimately recovered. While under the influence of the avertin the perspiration ceased, the musculature relaxed, the pulse was good, and respiration was free and regular. At 5.30 p.m. the effect of the avertin had worn off, to such an extent that convulsions were recurring again at frequent intervals and the general condition was such that it was recognized that only by controlling the convulsions could any prospects of saving the boy's life be entertained. A second dose of avertin, 1.3 g., was therefore given rectally at this time. With the second dose, the effect was much more pronounced and relaxation remained good until about 11 p.m. From this time onward the boy became restless and had mild twitchings, with increase in the muscular tone. At 12.10 a.m. he went into an extremely severe generalized convulsion in which he expired, eleven and one-half hours after admission. He had received 15,000 units of anti-tetanus serum intrathecally, 25,000 units intravenously, and 5,000 units about the wound in the heel.

CASE 2

M.P., a female, aged 8 years, was admitted on July 23, 1934. The complaints submitted by the mother were that there had been rigidity of all voluntary muscles for three days and pain in the extremities.

On July 16th the child had developed a pain in the neck. This persisted, until by July 20th the neck was very stiff and could not be flexed. On July 22nd rigidity extended to the upper and lower extremities. Solid food could not be taken on account of the spasm of the jaw muscles. Convulsions had occurred, but apparently were not very severe. Consciousness had been retained. A diagnosis of tetanus was made, and a combined course of treatment with avertin and serum instituted. Fourteen c.c. of a 25 per cent solution of magnesium sulphate

were injected intramuscularly in the right thigh; 5,000 units of anti-tetanus serum were given intraspinally and 20,000 units intravenously. The following day, 10,000 units were given intramuscularly. For the lumbar puncture it was necessary to employ general anæsthesia, without which painful peripheral stimuli at once precipitated generalized convulsions. Before the effects of the ether anæsthesia had worn off avertin, 2.4 g., was given rectally.

In the treatment of this child particular attention was paid to the desirability of keeping her continuously under the influence of avertin. Consequently, when she began to recover from one rectal instillation of avertin another was given. In this way avertin was given continuously from July 24th to July 30th, inclusive, 19.2 g. being used altogether. There was no set interval between the doses, as the drug was repeated primarily on clinical indications, *viz.*, the return of consciousness and the return of marked muscular rigidity. It was found that under the dosage used rigidity did not entirely disappear, but consciousness was abolished. There was no sensation of any pain, and the ordinary care and treatment, including the administration of intravenous and intramuscular injections could be carried on without producing any reaction on the part of the patient. Fluids were administered by nasal catheter and by intravenous injections of glucose and saline. After July 30th no more avertin was given. It was found that, although considerable muscular spasm remained, the mouth could be opened about half way without pain and the muscles of the extremities and abdomen, while still moderately rigid, were not very painful. Relief, when necessary, was obtained by the use of salicylates and barbiturates. The spasm of the muscles disappeared very gradually, the last groups to become normal being the masseters and the plantar flexors of the leg.

On discharge, August 17th, all muscular spasm had disappeared and recovery was considered complete. In this case the portal of entry of the infection was never determined conclusively. The child had been running about barefoot and there were many abrasions about the feet, all of which were superficial. One of these was excised, but we were unable to demonstrate tetanus bacilli in it.

The two cases just reported are not strictly comparable. The first was clinically a much graver infection, judging from the early and continued appearance of convulsions, and the patient might have died in any event. In retrospect, we are of the opinion that it would have been wiser to have been more courageous in the dose of avertin. The second case, although milder than the first, yet was of more than ordinary severity, and the energetic and continued use of avertin, we believe, contributed greatly to the ultimate recovery. We must bear in mind that the spasms and the convulsions are an immediate emergency and constitute a very grave menace to life. The risk of overdosage, when the drug is prudently employed, seems much less than the risk of allowing the convulsions to continue.

Bourne and Gurd[7] point out that the main danger of overdosage is respiratory failure. Inhalation of CO_2 combats this, if properly employed, and the injection of ephedrin interrupts or shortens the effect of avertin. Ordinarily, a dose of 0.1 g. per kilogram of body weight is considered the maximum. It is given in 2.5 per cent solution rectally, about 10 minutes being allowed for the quantity to be instilled into the rectum. Slow administration lessens the liability to rapid absorption and respiratory depression. From cases reported we find that the above dose has frequently been exceeded in tetanus without bad results. The fact that patients have been kept under the continuous influence of avertin for as long as two weeks speaks strongly in proof of the relatively low toxicity of the drug.

Avertin is the latest important addition to the therapeutic armamentarium for the treatment of tetanus. It does not in any way replace the necessity of using antitoxin. Its judicious use not only tremendously decreases the mortality but, from the patient's standpoint, is more humane than any other method employed. Until a better drug is discovered it should form part of the recognized treatment.

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ORANGE DERMATITIS.—J. Avit-Scott reports a case of dermatitis due to oranges. The patient, a woman, had suffered from a recurring rash on the fingers and hands of seven years' duration, and had submitted to many forms of treatment. Careful questioning elicited the fact that she was in the habit of taking liquid paraffin flavoured with orange juice every night. When this was stopped the eruption cleared up completely. Subsequently as an experiment she took some oil and orange juice again and the rash recurred within twenty-four hours. She also found that if she drank orange juice prepared by anyone else she felt a slight pricking in the fingers, but that if she touched an orange, peeled or unpeeled, or if any of the juice got on her fingers, there was a recurrence of the eruption.—*Brit. J. Derm. & Syph.*, Aug.-Sept., 1934, p. 378.

A NON-ASYLUM TREATMENT FOR ACUTE MANIA*

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CASES of acute mania are perhaps the one type of mental disorder in which both physicians and family cooperate in rushing the patient to an asylum. The symptoms are such as to make it impossible to care for the patient at his home or in a general hospital, and, in spite of the fact that in many cases the physician feels that the condition is temporary and within a comparatively short time a recovery will take place, there is no alternative save commitment, with its accompanying stigma on both patient and family. I feel that a certain percentage of these cases can not only be saved from commitment but in addition can have the length of their attacks materially shortened by the induction of a prolonged twilight condition. I can here only briefly indicate the procedure, and must eliminate all details and theoretical considerations.

SELECTION OF CASES AND COUNTER INDICATIONS

Patients comparatively young, not past the fifth decade of life, are of course the best risks. The doctor must be able to exclude any marked organic disease, and, equally important, any infections, even if they are only slight in nature. Above all, there must be no tendency to a small thready pulse; in other words, the pulse and blood pressure must be adequate. The type of mania is also to be considered, *viz.*, if it is of a pronounced schizoid type, a type which is fairly certain to render commitment inevitable, the physician may not consider it worth while to go to the expense and trouble of this procedure. In addition, the attack must be of short standing and treatment instituted before the patient is firmly caught in the manic cycle, that is to say, within two or three days of the onset of the acute symptoms. Lastly, the family must be financially able to afford both day and night the services of highly trained nurses.

THE SELECTION OF DRUGS AND THE CONDUCT OF THE CASE

No one narcotic should be depended upon entirely. The wider the range, the more varied the action and methods of excretion of the drugs employed, the better. I have utilized somnifen, ortel, amytal and nembutal among the barbiturates; among the non-barbiturates, hyoscine, paraldehyde, (used intravenously), and, lately, avertin. If possible, I try to secure a balance between the barbiturates and the non-barbiturates; avertin helps greatly in this. Lastly, I try to give the drugs whose action is powerful and prolonged in what I call "basal doses". For example, if the patient requires 5 c.c. of somnifen to control his excitement and put him to sleep I will give only 3 or 4, and ignite it, as it were, with, say, 150th of a grain of hyoscine, 2 c.c. of paraldehyde, very occasionally, with 1/6th of a grain of morphia. These small secondary doses soon lose their effect, but they serve the purpose of quieting the patient and allowing the basal dose of the initial drug to act; in addition one avoids plunging the patient into the profound stupor that would result if enough of the initial drug were given to control the excitement. The small initial dose, reinforced by the small secondary dose, aids greatly in attaining the end desired, *viz.*, keeping the patient in a twilight condition. Full consciousness and memory are abolished, it is true, but the patient is still in such a condition that he can take food and fluids when offered by his nurse, urinate into a bottle, use a bed-pan, or even be assisted to the bath room. If he shows signs of prematurely coming out of the basal state a second small dose of one of the secondary drugs will often prevent this and give him an extra two or three hours of "twilight" before another basal dose is given. The drug for this second dose should be different from the first, even if it is only another barbiturate; if possible, avertin should be used occasionally, which, with the

* A paper read at Quebec before l'Association des Médecins de Langue Française de l'Amérique du Nord, August, 1934.

drugs used as tinder, will obviate in a great degree the principal danger of the treatment, *viz.*, the action of the barbiturates on the blood pressure. As a further safeguard I now keep coramine within reach of the nurse.

The main outlines of this procedure are now sufficiently clear. The ideal to be aimed at is to keep the patient in a twilight condition, with his excitement so controlled that he can be given the necessary attention. Too great a narcosis should be avoided. The patient can be quite restless; he may talk a great deal; he may apparently recognize his nurse and doctor, and carry on a conversation with them, but he will still be in a perfectly satisfactory twilight condition. I have had patients who, with assistance, always went to the bath room, ate their meals from a tray, argued about their hypodermics and pills, and yet these patients afterwards retained absolutely no memory of anything that occurred during the whole course of their treatment.

COMPLICATIONS AND PRECAUTIONS

Any tendency to a weak thready pulse during any stage of the treatment should occasion alarm, unless it can be controlled; it is a signal to abandon the procedure. Expect a little rise of temperature with some increase of pulse after the first day or so, but if the pulse and temperature rise much above 100° look for the cause. Incidentally, this cause can often be found in constipation or some slight infection. Remember that these patients are continuously in a "four o'clock in the morning" state, and consequently any slight throat or dental condition, a slight infection from a catheter, etc., will often cause marked reactions. For the same reasons the nurse must carefully guard the patient against any possibility of "catching cold".

In conclusion, one must emphasize the fact that to successfully conduct such a treatment the doctor must be prepared to give heavily of his personal care and supervision. The nurse must always be able to reach him, for complications may arise, it may be necessary to feed the patient by a nasal tube, intravenous glucose salines may be indicated, enemas nearly always have to be resorted to, and sometimes catheterization is necessary. To sum up, no doctor should undertake the conduct of one of these cases unless he possesses the faculty of being able to estimate accurately whether a patient is doing well or the reverse.

Since I am not in outside practice my opportunities of finding early cases that fulfill the conditions outlined above have been small; they number exactly 6; of these, 5 cases have been apparently successful. In one I found it necessary, owing to the patient's physical condition, to terminate the treatment after three days. The patient was then admitted to a mental hospital, where she remained four months.

I here quote two cases only.

CASE 1

A male, 43 years old in 1929.

Previous history.—This patient had suffered four attacks of mania since the age of 21. Each attack had necessitated his sojourn in an asylum for from 4 to 9 months. His last attack was in 1923 and had lasted 9 months. In January, 1929, I was consulted by his family as he had been for two days in a very excited condition and they were sure he would have to be once more interned. I saw the patient and found him in a state of maniacal excitement. I immediately induced a state of narcosis, which I kept up for fifteen days, keeping him in bed after I terminated it for another week. The patient went back to business in another two weeks and was well until November, 1933, when his family warned me that he was about to have another attack. I went to see him, and, in my wisdom, decided that I would let him go for another day, thinking his condition was not yet serious enough for me to take action. That night he drove his car into the country, wrecked it, got out and threw away all his belongings, including most of his clothes, and then wandered about for nearly twenty hours before he was found by the Provincial Police and brought back to me. When I saw him he was handcuffed, every article of value had been thrown away except his ring, which he had placed on his penis. The mental state was typically manic, and again I induced a state of narcosis for two weeks. He was back at business again within a month and has remained well up to the present.

CASE 2

A female, aged 30 in 1931.

This patient had a history of an excited period in 1926, lasting three months, but she was not committed at that time. I saw her in October, 1931, at which time she presented a fairly severe manic reaction. She was kept in a twilight condition for ten days and so far has had no recurrence of her attack.

EFFECT OF ATHEROSCLEROTIC PLAQUES ON DIAMETER OF LUMEN OF CORONARY ARTERIES.—Stewart, Birchwood and Wells examined a small series of hearts to determine the relation between the size of the lumen of the coronary arteries at the site of atherosclerotic plaques, as seen in the collapsed artery in the usual post-mortem examination, and the true size of the lumen when the artery is distended by the usual blood pressure. The results indicate that coronary arteries exhibiting many atherosclerotic plaques which, as seen at post-mortem examination seem to cause marked local constrictions, may, when distended by the usual blood pressure, possess a fairly uniform lumen without evidence of constriction. Apparently the atherosclerotic plaques in coronary arteries do not necessarily protrude into the lumen during life, and the apparent narrowings seen in the dead body may not have existed during life.—*J. Am. M. Ass.*, 1935, **104:** 730.

Case Reports

PRIMARY CARCINOMA OF THE LIVER OF UNUSUALLY MASSIVE PROPORTIONS*

By C. E. Cooper Cole, S. O. Rogers, A. C. Norwich and G. W. Lougheed,

Toronto

The report of this interesting case seems to merit being put before the profession, first, on account of the almost record-breaking size of the primary tumour, and, secondly, because the course of the victim's illness was so protracted and so benign in spite of the size of the tumour that for a time doubts were entertained as to its actually being carcinoma.

The patient, Alex F., was pensioned for a gunshot wound of the left shoulder. This wound, however, had not interfered with his working steadily until May, 1933. Early in July, 1933, he began to complain of pain in the abdomen, occasional vomiting, and of swelling in the mid-abdomen. He had few other complaints, but recognized that he was not as strong as formerly. He was admitted to the Deer Lodge Hospital in Winnipeg. At this time a diagnosis of carcinoma of the liver was made, largely from the evident and nodular enlargement of this organ. He was transferred to Christie Street Hospital in September, 1933, and at this time did not appear in any way cachectic, showing only slight loss of weight, very slight jaundice of the eyes, though presenting on examination an enormous mass in the abdomen which seemed to be part of a generalized enlargement of the liver, reaching well over to the splenic area and downwards almost to the pubes. The surface of this mass was rough, ridged and bossed, extremely hard, and the mass itself occupied so much of the abdomen that but little movement was noted with respiration. A picture of the chest and abdomen showed that the diaphragm was high, but that there was no fluid in the chest in any great quantity. During the ensuing months fluid accumulated in the abdomen and he developed œdema of both legs. He had been taking large quantities of morphine, which seemed to have materially lessened the output of urine, and as the amount of morphine was reduced it was interesting to note that the ascites and œdema of the legs lessened materially. His appetite returned, an obstinate constipation was relieved, a difficulty in passing urine disappeared, and, as the blood count remained persistently normal, the possibility of there being present some condition other than carcinoma was entertained. Active antisyphilitic treatment was instituted in the hope that we might be dealing with a massive gummatous condition. In support of this hope one may refer to the remarkable pictures in Rolleston's "Diseases of the Liver", which illustrate the colossal proportions to which syphilitic livers may attain. The fact that the man had come from the Winnipeg district allowed one to suggest the possibilities of hydatid disease, although the stony hardness of the mass spoke against this view. There was no hydatid thrill, and no suggestion from the examination of blood or stools that the man was harbouring any intestinal parasite. There was some question for a time as to whether there was any associated enlargement of the spleen, but it was finally determined that the enlargement under the left lower ribs was part of the left lobe of the liver. Radiological examination of the gastro-intestinal tract showed the stomach always well displaced to the left. There was no evidence of carcinoma of the intestinal tract. The prostate was small. The pictures of the chest showed no mediastinal enlargement and the man's glandular system seemed not to be involved in metastases. Repeated paracenteses were necessary, and careful examinations were made of the cells found in the fluid. In one of these cells were found undergoing mitotic division and so arranged that the proof of malignancy seemed complete.

Surprisingly little change took place in the man's condition during the fall and winter months, but early in March, six months after his admission to Christie Street Hospital, rapid failure ensued and he died on the 20th of the month, after a surprisingly painless residence of six months in the hospital, during which time he nursed a malignant tumour, filling nearly the

* From the Department of Pensions and National Health, Christie Street Hospital, Toronto.

whole of the abdomen, involving the whole or greater part of the liver, and probably by its pressure on the inferior vena cava causing the extensive œdema of the legs.

At the autopsy there was but little of interest apart from the massive tumour of the liver. There was fluid in the abdomen and both chests. No suggestion of a primary tumour growth other than in the liver was anywhere in evidence. There were a few large glands in the mediastinum. Prostate, testes, gastro-intestinal tract, lungs, œsophagus, were carefully examined and showed nothing. The other organs of the body showed no changes of interest. Bile flowed freely into the intestine, and the intestinal contents showed a normal colour. There was but little evidence of jaundice, nor had the various tests made in the laboratory in connection with the liver's activity shown anything at all suggestive of marked interference with liver function. Signs of syphilitic infection were lacking, both heart and aorta being in good condition for a man of his age. There was moderate enlargement of the spleen. The kidneys showed some slight changes, but tests of renal function had shown that these organs were functioning well.

The liver, an enormous mass, 48 by 33 by 17 cm., and weighing 24 lbs., was extensively involved with multiple nodular growths, in size varying from that of a pea to a small apple. Many of these were depressed in their centres where necrosis had begun; their general colour was greyish-white, standing out prominently in the little altered liver tissue. The liver substance itself seemed of a fairly normal colour; there was no gross evidence of cirrhosis. The gall bladder and larger bile ducts were not involved in the cancerous process. In the gross specimen, centrally located, and at a point over which clinically intense hardness had been noted, there was a mass 7 cm. in diameter, which cut and looked like cancellous bone, but which on microscopic examination proved to be a dense calcareous deposit. The pancreas appeared to be unchanged, although perhaps slightly thickened.

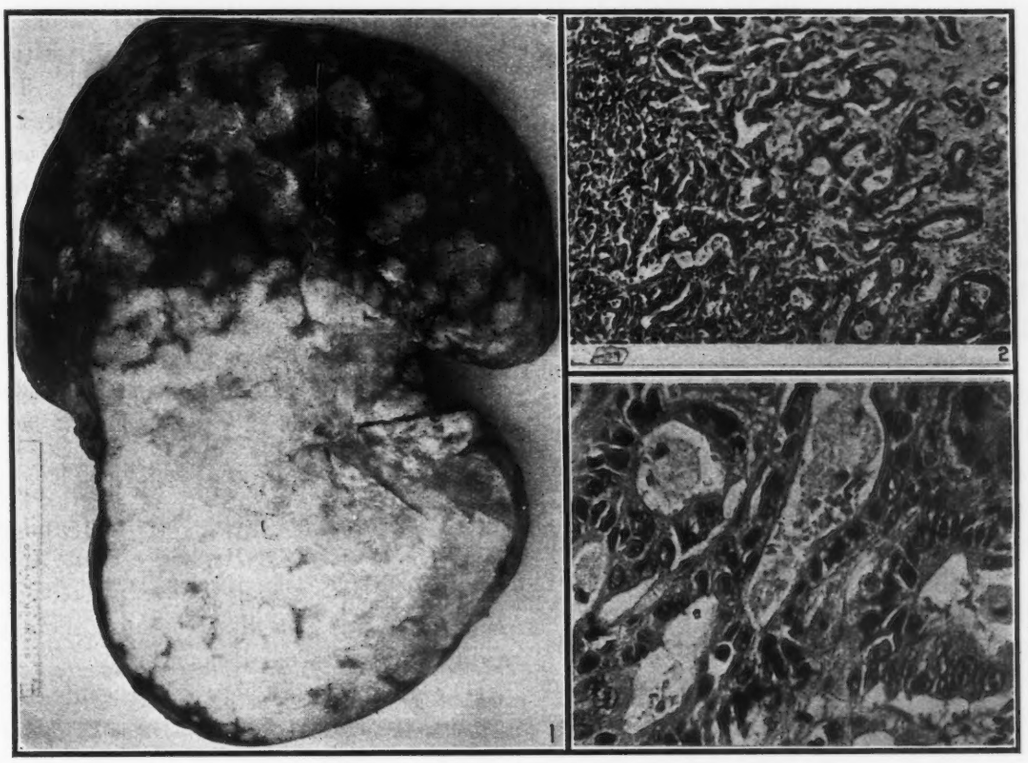


FIG. 1.—Gross specimen.

FIG. 2.—Low power microscopic section.
FIG. 3.—High power microscopic section.

We had the good fortune to present this specimen before the Association of Pathologists and Bacteriologists, meeting in Toronto early in April. The conclusion arrived at after its inspection by many of the most eminent pathologists of the continent was that it represented a primary carcinoma of the liver, probably originating in one of the bile ducts of the left

lobe, then invading the whole of the liver in a multiple and nodular process. Dr. Lougheed's report may be given as follows.

"Microscopic slide of the specimen shows groups of atypical vesicular cells in pseudoglandular formation, invading and destroying the liver. There is no primary growth found elsewhere and because of the extensive involvement of the liver and the size one must come to the conclusion that it is probably a primary carcinoma of the bile duct of the left lobe, invading the whole of the liver and giving rise to secondary involvement of the glands in the mediastinum. Diagnosis: carcinoma, of 'adeno' type, originating in the bile duct of the liver."

From the clinical side the most interesting feature, apart from the amazing picture presented by the massive tumour in the abdomen, was the protracted and painless course of the patient's illness. Hale White is credited with the statement that death in primary carcinoma of the liver is usually a matter of about four months from the time of the tumour's discovery. Our patient lived for full nine months after the growth had been first detected in the left lobe of the liver. The absence of jaundice and pain was noteworthy.

From the pathological side one notes with interest that the size of this remarkable primary carcinoma approached that more usually associated with secondary growths, in which disorder livers weighing 15 to 40 lbs. may be met with. Figures detailing the weights of primary carcinomas of the livers do not seem to be readily available, and neither Rolleston's article in the Oxford system, 1925, nor Lyon's description in the Osler-McCrae system in 1926 make mention of the size and weight to which a liver affected with primary carcinoma may attain.

As is well known primary carcinoma of the liver is much more rarely met with than is the secondary, and is a comparatively rare disease. Hale White reports finding only 11 cases in 11,500 autopsies. One of the largest collections, that of Eggel's in 1901, totals 163 cases. Rolleston's collection numbered 42. The association of primary carcinoma with such conditions as hæmochromatosis and with the cirrhosis from schistosomiasis has been noted.

The tumour we are describing would probably be described as a nodular or multiple carcinoma. From its microscopical description one would suggest that it had arisen from the epithelium of the bile ducts.

A CASE OF TRAUMATIC RUPTURE OF THE SPLEEN

BY JOHN P. BONFIELD, M.B., M.R.C.S.(LOND.),
Ottawa

A boy, aged 12, was admitted to the hospital on October 16, 1934. The parents gave a very vague history of the child falling on a stone while running in the vicinity of his home. This accident occurred on October 14th, about 10.30 a.m., and it was stated that he walked into his home, a distance of about 200 yards. In the afternoon he became acutely ill, with severe abdominal pain and vomited once. The pain lasted about two hours, and recurred on the following day, Monday. The child suffered more or less all that day, but his local physician did not see him until early Tuesday morning, October 16th. The case was recognized as an acute abdominal condition, and he was sent to the hospital.

On admittance the child had a very rigid abdomen; there was no distension; he was very tender throughout the abdomen, but he was so restless and irritable and so acutely ill that it was impossible to localize his pain or believe what he stated about it. His temperature was 100°; his pulse 88. He had a white cell count of 17,000. His urinalysis was negative. A red cell count was not taken because there was no evidence of internal hæmorrhage.

The diagnosis lay between an acute traumatic condition or else an infective one. It seemed impossible that a fall such as that described could have caused such grave intra-abdominal mischief, and so it was thought that we were dealing with an infective process, with the history of the fall fitting in as a coincidence. However, the history could not be ignored altogether, and an incision was made well towards the middle line through the right rectus. The abdominal cavity contained free blood. The spleen was immediately sought, and was found by touch to be evenly divided, with the lower portion attached to the upper by a very small margin of tissue. This lower portion was removed. It was impossible to visualize the field of operation on account of the incision, and so the security of the pedicle was tested by loosening the grip upon it. When this was done no fresh hæmorrhage occurred, and so it was judged

that all hæmorrhage had ceased, and, as time was entering into the case, the abdomen was closed without drainage after performing the toilet of the peritoneum. The following morning the boy was given a direct transfusion of 500 c.c. of blood. He left the hospital at the end of twelve days, returning to his home in an automobile forty miles away.

A few days after I had operated on the case the father informed me that he had been misinformed, and that, instead of falling on a stone, the child had been kicked by a horse. Had the correct history of the case been obtained in the beginning, the diagnosis most likely would have been clear, and a better incision planned. However, the patient may have been fortunate, because, if I had been in the position of easy access to the splenic pedicle, I should have removed the remainder of his spleen which is, in all probability, carrying on a very useful function.

Clinical and Laboratory Notes

THE HYDROPHTHALMOSCOPE

By W. H. M. THOMSON,

London, Ont.

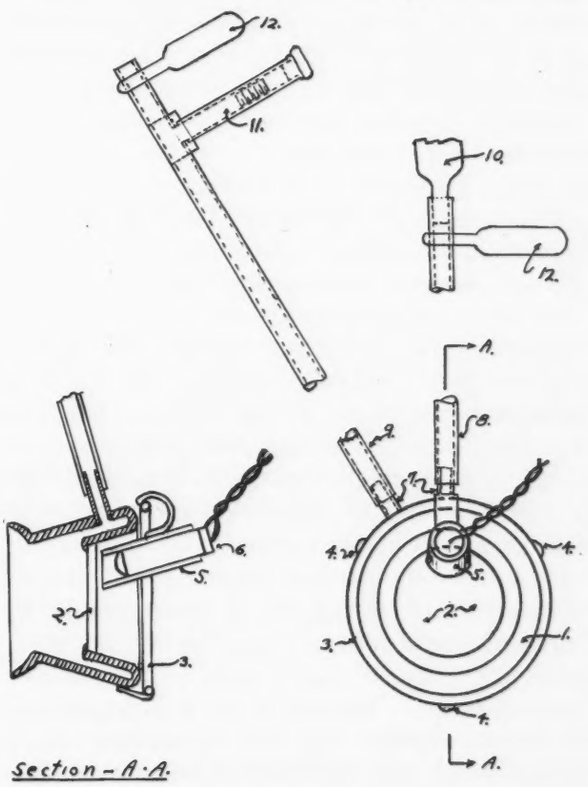
The instrument depicted in the sketches allows constant observation of the fundus oculi while surgical or experimental procedures are being performed thereon. In operating or experimenting on the retina under the guidance of the ordinary hand ophthalmoscope the observer's eye must be awkwardly close to the eye being worked upon, and, secondly, one hand must be used to hold the ophthalmoscope.

The device described here eliminates both the above difficulties, as it allows a constant view of the fundus through a dilated pupil up to a distance of thirty inches or so, and, as it is self-retaining by means of suction, the device can itself be used to hold the eye steady while the other hand manipulates a forceps or needle through a scleral incision.

The draftsman's sketches are almost self-explanatory. The scleral ring is inserted under the lids, and saline is then drawn into the instrument by means of a 10 c.c. syringe until the fluid covers the under surface of the plane glass (2), at which instant the fundus springs into view. A clip is then placed on the rubber tubing distal to the vacuum gauge (11). and the plunger of the 10 c.c. syringe is withdrawn a little more, when a second clip is placed on the outlet tube. Air bubbles rise out of the way into the space surrounding the observation glass (2). The hydrophthalmoscope is now held on the eye by negative pressure, and the minute electric bulb in the rotating rim (3) is connected to dry cells. In the human eye nupercain, 1:1,000, is used fifteen minutes before inserting the device. The patients complain of no pain, but the vacuum causes a feeling of heaviness.

In the Department of Physiology at the University of Western Ontario I have been using this device nearly a year now in experimental work on retinal detachment, and by its use procedures impossible otherwise are easily carried out. For example, using a syringe and needle, it is a simple procedure to balloon off the neuro-epithelial layer of dogs with sterile saline, since the position of the penetrating needle can be easily seen at all times up to a distance of arm's length.

When I first devised the instrument I thought I had something entirely new until my attention was called to an article by Batton in the *Ophthalmoscope* of February, 1910. His



OCULOSCOPE

1.—Brass frame.
2.—Observation glass.
3.—Movable ring.
4.—Holding lugs.
5.—Lamp housing.
6.—Lamp.
7.—Small brass tubes.
8.—Inlet rubber tube.
9.—Outlet rubber tube.
10.—10 c.c. syringe.
11.—Vacuum gauge.
12.—Bull dog clamps.

device however, was to be used in cases of distorted corneas, and was neither meant nor adaptable to facilitate surgical procedures on the fundus oculi, since it rested externally to the lids, had a diameter of 37 mm., and was not self-illuminated.

The device is being improved with a view to bringing the light in from the side, and it has been found that a 30 degree prism placed on the observation glass bends the efferent rays so that a more inclusive view of the fundus toward the periphery may be seen.

Editorial

THE USE AND ABUSE OF CODEINE IN CANADA

AN article by Dr. David Slight, of Montreal, entitled "Codeine Addiction", which appeared in the January issue of the *Journal* (see page 69), deals with a matter of considerable importance and has attracted much attention. It certainly provides food for thought, and indicates a need for more information.

Doctor Slight calls attention to the difference of opinion that has existed and, indeed, still exists, among authorities on the question whether the use of codeine can be abused and lead to addiction or not. He also brings up the further question whether addiction to codeine implies previous addiction to opium in its various derivatives and preparations, such as crude opium, morphine, heroin, and paregoric. At the moment codeine is classed in the International Convention as a "Non-habit-forming Drug", and, therefore, it is not on the list of dangerous drugs. Accordingly, the Narcotics Act of Canada, in conformity with the legislation in other countries, merely controls the importation and exportation of codeine. Whether such control is sufficient remains to be seen; one is constrained to doubt it.

As the medical profession is well aware codeine is a highly valuable drug, competent from some of its qualities to take the place of the more dangerous morphine and heroin. Consequently its use has become popular in medical prescriptions and the drug enters into the composition of many proprietary preparations. This being so, it is important to know whether the use of codeine is attended with any undesirable features. Certain questions arise at once. (1) Is codeine a habit-forming drug or not? (2) If it is, is there any danger to be apprehended from its use in the amounts ordinarily prescribed by physicians, or does danger lie only when the drug is used for a continued period in massive doses? (3) Is addiction to codeine met with only in persons who have previously been addicted to narcotics such as opium, morphine and heroin, or can it arise *de novo?* (4) If addiction to codeine exists are the withdrawal symptoms comparable with those familiar to us in cases of addiction to morphine? On the answers to these questions, naturally, appropriate administrative action depends.

We are indebted to Col. C. H. L. Sharman, Chief of the Narcotics Division of the Department of Pensions and National Health, Ottawa, for much of the information on which this leader is based. His facts are startling.

For instance, Canada has the doubtful honour of leading the world in the *per capita* consumption of codeine. The figures, which include those for certain comparable countries, are as follows:—

Country	*Kilograms of codeine per million inhabitants*
Canada	109
United States	29
Great Britain	11
Australia	4

Why is this?

Further, taking Canada alone, it will be seen that the importation of codeine has steadily increased of late years. The figures are:—

Year	*Importations of morphine and heroin in ounces*	*Importations of codeine in ounces*
1920	28,198	Not available
1927	8,873	9,330
1933	5,316	36,313
1934	5,476	46,190

From this it is clear that the *increase* in the importations of codeine is concomitant with a *decrease* in the amount of morphine and heroin brought in.

Why is this?

The situation clearly calls for investigation, and it is satisfactory to know that it has been engaging the active interest of the Department at Ottawa, through its Narcotics Division, for a year or more. Already some pertinent facts have been laid bare.

The cases reported by Doctor Slight and by others who might be mentioned prove, we think, beyond question that there is such a thing as addiction to codeine, and one of Doctor Slight's cases also proves that the habit may arise without any relationship to previous addiction to morphine or heroin.

The experience of the Narcotics Division of the Department of Pensions and National Health leads inevitably to the conclusion that the consumption of codeine in Canada is far in excess of the requirements of ordinary medical practice. It is not uncommon, for example, for the agents of the Narcotics Division, when investigating both ordinary and Chinese underworld circles, to come across bottles of codeine, with the usual apparatus for administering the drug hypodermically, in the possession of persons known previously to have been addicts to opium, morphine, or heroin, and this not in one but in several cities of Canada. This is probably to be explained by the activity of the Narcotics Division which has made these particular narcotics difficult to obtain, and, of course, correspondingly expensive. There has been, therefore, a resort to codeine (which is not illicit, and is easily obtainable) as a "carry-over" until the former sources of supply could again be tapped. This diversion towards codeine was, doubtless, accentuated by the further control over paregoric, which began in 1933. Some of those who were experimenting with codeine found that they "got results" by using massive doses (necessarily much higher than were required with morphine), which they administered hypodermically, a method which is practically never employed by the medical profession. One case is known where as much as eighty grains daily were taken.

As is well known, the majority of the cases of addiction to morphine or heroin are not attributable to previous medical prescription of these drugs, but are the result of imitation and of association with persons taking them habitually, and it is not an unfair inference that the same state of affairs must exist in regard to codeine. Doctor Slight's conclusion that true addiction to codeine exists is supported by the investigations of C. K. Himmelsbach, Assistant Surgeon in the United States Public Health Service, who found, in the case of seven men thoroughly addicted to morphine, that this drug could be satisfactorily replaced (from their standpoint) by adequate doses of codeine, which meant, on the average, five times the dose of morphine to which they had been accustomed, and that the symptoms which resulted from the abrupt and complete withdrawal of the codeine did not differ materially from those met with in the case of morphine under the same circumstances.

During the summer of 1934 Colonel Sharman placed the situation, as it appeared to exist at that time, before the Council of the Canadian Pharmaceutical Association. As a result of this consultation, and with the cooperation of a number of wholesalers of narcotics, a scheme for the control of the sale of codeine (not covered by any legislative authority, which does not, indeed, exist) was initiated on December 1st, 1934, under "a gentleman's agreement", whereby these wholesalers undertook to supply codeine only to those mentioned in Section 5 of the Narcotic Act, namely, other licensed wholesalers, physicians, retail druggists, etc. and to report their sales monthly, both to the Narcotics Division, Ottawa, and to the Registrars of the provincial Pharmaceutical Associations concerned. If in the opinion of a provincial Pharmaceutical Association any sales to retail druggists are excessive it is entitled to recommend that further sales to such offending druggists be prevented. The wholesalers have undertaken to accept and act on such recommendations when received from the Department. Reports from all the wholesalers handling codeine during the month of December last came to hand about the end of January of this year, and it became immediately apparent that all was

not well. Some retail druggists had purchased as much as two hundred ounces. Obviously, there is need for control. In Canada the conditions under which codeine can be purchased in the drug stores vary according to the provisions of the different provincial Pharmacy Acts. At the present time Manitoba is the only province in which a physician's prescription is essential, but it is said that British Columbia is moving in the same direction. Apart from this exception there is little difficulty in the other provinces in obtaining all the codeine one wants.

The pertinent information collected by the Narcotics Branch was presented by Colonel Sharman to the Opium Advisory Committee of the League of Nations last November, and that body referred the question as to whether codeine was to be regarded as a drug of addiction or not to the Health Committee of the League, with a request that the latter communicate the result of its enquiry to the Advisory Committee at the earliest possible moment.

It would facilitate the study of this important question and be of assistance to the Department of Pensions and National Health of Canada if physicians would communicate with the Narcotics Division at Ottawa in regard to any cases of the unwarranted use of codeine which have come under their notice. The information submitted should, preferably, cover the following points, namely, (1) whether the persons concerned have a history of previous addiction to narcotics; (2) the daily dosage; (3) whether the codeine is taken intravenously or otherwise; and (4) the length of time that the drug has been taken. The Narcotics Division, however, wish to make it clear that they do not consider the present situation to be occasioned by the use of codeine in anything like the dosage ordinarily employed in medical practice, and that there is no reason to feel uneasiness in connection with its proper and legitimate use. A.G.N.

PROBLEMS OF THE NURSING PROFESSION

THE nursing profession of Canada faces its problems with a frankness and courage which might well arouse the envy of others. This is a matter of importance, not only to the nursing profession itself but to the general public, the recipients of nursing care, and, in particular, to the medical profession, which leans so heavily upon the nursing profession in providing for patients the care they require.

It is now generally accepted, following upon the Weir report, that nursing education in Canada leaves much to be desired. The present system is that of apprenticeship, which means that the nurse-in-training is used by the hospital for hospital services instead of devoting her time to her education. It seems obvious that the first step towards better standards of education should be preceded by a definition of the several fields of nursing and the type of nursing personnel required to do the work in these different fields. Conditions have changed since the first training-schools were established. The whole field of public health has developed, and in that field the public health nurse has become the most important figure, both numerically and effectively. With changing economic conditions, the appearance of the apartment and the disappearance of the unmarried woman from the home and her entrance into the business world, together with other factors, has come the development of visiting-nurse service in the home. This form of nursing service was started primarily as a service for the less fortunate members of the community by the Victorian Order of Nurses for Canada. This Order has shown that, through the organization of a qualified staff of nurses, receiving supervision from a central office, it is practical to provide a nursing service of a high standard. From this beginning the service has been extended to furnish the same type of service for the whole community. The good offices of the Order could well be utilized by the medical profession to a greater extent than they are.

It would appear that the time has come for nursing to follow the other professions out of the apprenticeship stage of preparation into provision for a more adequate system

of nursing education. At the last annual meeting of the Canadian Nurses' Association, President Wallace, of the University of Alberta, delivered an address under the title of "A Challenge to the Profession." This is one of the finest presentations of the subject which has been made, and every practitioner should read it. As an educationist and a humanist, President Wallace sees the need for schools of nursing as a part of the university, to receive only such students as are qualified for university registration, at which schools the student will pay fees and receive an education in the fundamental sciences upon which the profession is based, as well as being given the intellectual training which allows for a wide, intelligent interest. It can hardly be doubted that this change will come about slowly but surely. We must face the fact that if nursing services are to be on a sound basis then the nursing profession must be allowed to control the licensing of those who are to practise nursing. Just so long as anyone, regardless of training, is allowed to call herself a nurse, no control can be exercised. Likely, there is a place for visiting housekeepers, and others, to meet the needs of the home which grow out of illness. If so, these should all be controlled through one central body in the interests of the community. This is becoming a matter of practical politics in view of the development of health insurance.

It is high time that the medical profession take a more active interest in the welfare of the nursing profession. It is perhaps fair to say that the nurses must decide what they want; that is not for the medical profession to do, but once the nurses have made their decision, the medical profession should be ready to give the most active and sympathetic support to those efforts which will ensure the best nursing care for those requiring it at terms they can afford to pay. G.F.

Editorial Comments

The First "Osler Day"

The inauguration of an annual Osler Day at Hamilton, Ont., which took place on February 27th last under particularly auspicious circumstances, was an event that bids fair to be of real significance in Canadian medicine. The proceedings, of great interest throughout, were arranged on what might be described as a crescendo scale, in that the sense of personal contact with the life and ideals of the great physician waxed stronger with each successive stage of the well-planned program. The clinical morning at the Hamilton General Hospital; the great civic luncheon at the Hotel Connaught; Dr. Futcher's delightful address, with its clear evaluation of what Osler himself considered his greatest contribution to medical education on this continent; the afternoon visit to the beautiful Mountain Sanatorium, where the principles of rational preventive therapy of tuberculosis so dear to Osler's heart are seen applied in such ideal and outstanding fashion; and then the "Pilgrimage" itself to the little town of Dundas, only four miles distant from Hamilton, to Osler's boyhood home and to the office where he took his first fee, to the old water-trough by the roadside wherein floats today a replica of the same greenish scum that formed the subject of his earliest biological investigations, and to the cairn erected to his memory by the Hamilton Medical Society on the height overlooking the picturesque Dundas Marsh. Standing there in the waning sunlight of what had been a brilliant winter day, in full view of the lovely undulating countryside, where, to quote from the inscription on the cairn, this "Student, philosopher and physician" made the "early studies of Nature" which "laid the foundation of his career", each "pilgrim" felt perforce a responsive thrill that drew him closer to his fellows and kindled in his heart a fresh enthusiasm for a tradition which remains with us today as the best inheritance of the Canadian profession.

The touching associations of the day found fitting consummation in the intimacy of the informal dinner held in the evening at McMaster University, under the joint chairmanship of Dr. J. Heurner Mullin and Dr. Campbell Howard. In closing the proceedings Dr. Howard made the suggestion, pregnant with large possibilities, that in addition to the observance of this memorial at Hamilton and Dundas, which he insisted must become an annual affair, there should also take place, at not too long intervals, other gatherings and pilgrimages in the localities where Osler lived and worked in the successive stages of his career, at Toronto, Montreal, Philadelphia, Baltimore and Oxford, in the order named. This proposal, which was

received with applause, is deserving of the serious consideration and, we believe, of the support of the Canadian Medical Association and of the profession at large, for it means the conservation of the Osler tradition and spirit in those broader international relations which held his affection and were ever his first concern.

The Hamilton Academy of Medicine is indeed to be congratulated upon the inauguration by them, along these highly significant lines, of this annual Osler Day. This Association takes pride also in the part that was given to its Osler Memorial Committee in the organization of the arrangements, especially through its members, Drs. Howard and Mullin, whose initiative and labours contributed so largely to the eminent success of this commemoration.

M.E.A.

Tests for Respiratory Efficiency

In a recent report by Dr. Alan Moncrieff, issued by the Medical Research Council,* it is shown that there has been a long search for a method of estimating respiratory efficiency, but whilst many methods have been evolved few or none are simple or in general use. Dr. Moncrieff's monograph is concerned with a method of estimating the ventilating power and expiration time-ratio, together with a measurement of the expiratory phase by means of a mercury U-tube. His experiments in the case of 86 patients show that his method of investigating the respiratory efficiency is easily carried out and causes a minimum of discomfort for only a few minutes. Seriously ill patients have been able to take part in such investigations without any difficulty.

Dr. Moncrieff points out the increasing need for such tests for three different reasons: (a) the developments of thoracic surgery; (b) the medical examination of aviation pilots; and (c) the increased interest in industrial disorders of the lung which has accompanied compensation for these. In addition to these, of course, there is the value from such methods in estimating the respiratory efficiency in normally healthy people and deciding whether they are fit for special occupations, *e.g.*, flying, driving, etc. In addition, the physician might expect to find help in the doubtful case of lung disease, just as the surgeon is helped by renal efficiency tests. All these, however, are applications of the future. At the moment Dr. Moncrieff's aim was to estimate degrees and types of respiratory inefficiency by an objective method and this he has succeeded in doing by a simple easily performed procedure. H.E.M.

* Tests for Respiratory Efficiency. Alan Moncrieff. Special Report Series, No. 198. 62 pages. Price 1s. net. H.M. Stationery Office, London, 1934.

What You Should Know About Series No. I. Cancer

This little book has been prepared on the initiative of the Canadian Medical Association, through its Health Service Department, sponsored by Life Insurance Companies in Canada and under the general editorship of the Associate Secretary, Dr. Grant Fleming. Its purpose is to place before the general public the essential facts about cancer in simple, untechnical language, in the hope that this instruction will induce them to consult their physicians at once when any suspicious condition arises in their bodies. Only by cooperation of this kind between layman and physician can we hope to achieve that great desideratum—*earlier diagnosis.*

It may be said at once that the booklet admirably fulfils its purpose. In fact, it could hardly have been better done. There is no appeal to fear or sensationalism, merely a statement of facts and commonsense deductions from these facts. The story is briefly, but effectively, told, in only forty-one pages, and is presented in an attractive form.

The booklet will be on sale (price, twenty-five cents) in the leading book stores of the Canadian cities. If for any reason it is not readily obtainable application should be made to the Macmillan Company of Canada Limited, at St. Martin's House, Toronto, who are the publishers.

The booklet is heartily commended to the profession and it is hoped that medical men will draw the attention of their clients and others who may be interested to it. Its appearance is timely in view of the campaign against cancer which has been inaugurated in Canada under the title of "The King George the Fifth Silver Jubilee Cancer Fund for Canada". A.G.N.

The Diabetic Journal*

We have received the first number of *The Diabetic Journal,* a quarterly published in London by the Diabetic Association. So many journals come and go that this one might hardly excite any interest, until one looks further into it. Then one realizes that there is something unusual about it. There are few if any journals which are published by and for the interests of sufferers from particular diseases, although the idea lying behind such a publication is a sound and attractive one.

The Diabetic Association, we learn, came into being through the ever-industrious pen of Mr. H. G. Wells, himself a diabetic. He was asked to contribute to a large diabetic clinic in London, which was in need of funds. Mr.

* Published quarterly by the Diabetic Association, 59 Doughty Street, London, W.C.1., price 4s.

Wells thought, as one would expect of him, that such charity should be and was the concern of *all* diabetics, and immediately wrote to *The Times* (again as one would expect), expatiating on the formation of a Diabetic Association for the mutual aid of diabetics, for promoting study and treatment of the disease and diffusing knowledge of it. Mr. Wells has never been frugal in ideas, so to speak; indeed, as we all know, the exact and extreme opposite has always been the case. None that he has fostered, however, has taken root so firmly and quickly. The *Diabetic Journal* is the organ of the Diabetic Association, and one would judge from its pleasantly produced and readable contents that it should have an appeal, certainly to the large and increasing numbers of diabetics on both sides of the Atlantic, and probably to many medical practitioners. Even thus early, for example, a question is raised in its columns regarding diabetic cures administered by mouth, and the editor (Mr. Hugh Walpole) points out that no investigation of any account has been made of this point.

There is a great deal more in this journal on which we should like to comment, but will now do no more than draw it to the attention of the many who will find it useful and interesting. Perhaps however Mr. Wells' opening remarks may be quoted. He says: "I am very glad to salute our Journal. Therein we will write and discuss life as one Diabetic to another. We are a high and austere cult. Our characters are strengthened by a perpetual self-control; we have learnt to detest the pasty and the saccharine in thought, word and deed. We shall be plain and fine with each other. Formerly Diabetics died, but now I shall begin to look for the Diabetic influence in every aspect of life, in art, science, conduct, a new delicate strength, a restraint and a clearness. Am I writing nonsense? Not altogether. For my own part I have certainly found Diabetes an invigorating diathesis." H.E.M.

Retrospect

MORQUIO'S DISEASE AND ALLIED CONDITIONS

BY MADGE THURLOW MACKLIN,

London, Ont.

MORQUIO'S DISEASE, DAVIS, D. B. AND CURRIER, F. P., *J. Am. M. Ass.*, 1934, **102**: 2173.

HEPATO-SPLENOMEGALY WITH MENTAL DEFICIENCY AND BONE CHANGES, Ellis, R. W. B., *Proc. Roy. Soc. Med.*, 1934, **27**: 1022.

HEPATO-SPLENOMEGALY WITH MENTAL DEFICIENCY AND BONE CHANGES, Poynton, F. J., Lightwood, R. C. and Ellis, R. W. B., *Proc. Roy. Soc. Med.*, 1934, **27**: 1025.

A FORM OF GIGANTISM WITH SPLANCHNOMEGALY, Sheldon, W., *Proc. Roy. Soc. Med.*, 1934, **27**: 1003.

These four articles are reviewed together, here; for, although the diagnosis of Morquio's disease was not made in the last three cases, the history of the patients and their physical appearance are so suggestive of Morquio's disease that they should be included in this category.

This syndrome, first described as a clinical entity by Morquio in 1929, is characterized by enlarged liver and spleen, and an osseous dystrophy resulting in an "osseous exuberance in the vertebral column, in the epiphyses of the elbows, shoulders and knees, or by absence of ossification for example in the wrists." Dwarfism accompanied Morquio's syndrome in the 4 children in the family he described. In this family the grandparents and also the parents were related. In one of the children there was also mental deficiency. There have been, so far as I can find, 15 cases reported since then. Ruggles reported 3 children in a family of seven, 2 children in a family of three, and 2 isolated cases. Barnett reported 2 cases; Coward, 2 in a family of five; Dale, 2 in a family of seven; Meyer and Brenneman, and Ellman each report 1 isolated case. The findings in the earlier cases were emphasized as osseous in character, and mention of enlarged spleen and liver was first made in Davis and Currier's cases. The findings in Davis's cases are as follows. Two brothers of five children were affected, and a sister who was dead was said to have been just like them. The head was markedly enlarged, the nose depressed, and the chest showed marked flaring of the lower margin; there was beading of the costo-chondral junctions; the bones of the hands, wrists, and knees showed delayed epiphyseal growth; the spine lacked normal curvatures and showed areas of exuberant growth; the eyes were buphthalmic, the vision poor. Inability to extend the joints was present in both. Both had been treated for cretinism without benefit. The liver and spleen were much enlarged in these children.

In the children reported on in the *Proceedings of the Royal Society* no diagnosis was made, but that the three of them belonged to the same clinical entity was emphasized. In the family reported by Sheldon there were 5 children, with the last only affected; in Ellis' case the child had had an older brother who had died with enlargement of the liver and spleen, cerebral

hæmorrhage and hydrocephalus; in the case reported by Poynton and his co-workers there had also been an older child who died of hydrocephalus. There was no gigantism in the last two patients, although there was in Sheldon's. The three cases showed hepato-splenomegaly, heavy unchild-like facies, mental deficiency, more or less pronounced bone changes, such as frontal bossing, hypertelorism, deformities in the vertebræ, limited movement of the phalanges, poor development of the glenoid fossa and the acetabulum in the case of Poynton's, and enlarged sellæ in two of the three cases. The two boys both had an undescended left testicle which could not be felt.

Whether these three cases should be included in Morquio's syndrome is a question; certainly the three represent examples of a clinical entity. One of the cases suggests the hereditary factor, with two children in the family involved, and, finally, the three of them agree rather closely with the two cases described by Davis and Currier, both in clinical findings and in the facial and bodily conformation. Gigantism in place of dwarfism in one instance suggests the positive phase of a dyspituitarism instead of a negative. If the three English cases prove to be something other than Morquio's disease, there are represented then two hereditary dystrophies. Should they be Morquio's disease, we find 5 more cases added to the literature at the same time, suggesting that, although rare, it is not so rare for those who are on the lookout for accurate diagnosis of unusual clinical symptoms.

Special Articles

THE NEW CANADIAN DEATH CERTIFICATE

By W. R. Tracey, B.A.,

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Ottawa

For some years, the medical profession and those concerned with the recording of mortality statistics have felt the need for a revision of the Canadian Standard Certificate of Death. As a result of the hearty cooperation of all concerned in this important matter, the whole certificate, civil and medical, has been carefully revised and a new form prepared. The new certificate is being distributed this year for use throughout Canada.

It is of interest to recall that the old certificate was introduced at the time of the establishment of Canada's national system of vital statistics in 1920. The adoption of a standard certificate and the cooperation of the Provincial Registration Departments with the Dominion Bureau of Statistics has made possible the development of Canadian mortality statistics. The medical certificate adopted represented the most advanced views at that time in asking for not only the "cause of death" but "contributory causes" as well, and in providing for a statement of the duration of each. The increased attention, however, which has been directed to mortality statistics throughout the world in recent years led to a demand for a more satisfactory statement of the cause of death by the physicians, because the forms in use failed to give the physician the opportunity to clearly state his opinion.

As early as 1925, a recommendation was made to the Health Section of the League of Nations by a committee reporting on this matter that the form of the questions relating to cause of death on the medical certificate be so worded as to permit the physician to state clearly the relationship which exists between the causes given by him and to distinguish those morbid conditions which, in his opinion, brought about death from other morbid conditions. A recommendation similar in principle was made by the Committee of the International Institute of Statistics which met in 1927 to formulate the Preparatory Report for the revision of the International List. The Commission revising the International List in 1929 expressed approval of the principle, though for reasons of expediency it did not recommend a particular form of certificate. In 1927 a new certificate was introduced in England and Wales, incorporating these recommendations, and in 1930 the United States adopted a new form differing from that introduced in England and Wales, but resembling it in asking the certifying physician to distinguish between the train of diseases which led to death and any independent contributory causes which he considered important.

In Canada, as early as 1929, Mr. E. S. Macphail,* Chief of the Division of Census and Vital Statistics in the Dominion Bureau, corresponded with the Provincial Departments concerning the possibility of a change in the form of the medical certificate. Copies of the new forms in use in England and Wales and of the suggested certificate in the United States were discussed. Further consideration was given to

* Mr. Macphail retired in January, 1935. He had taken a very important part in the establishment of the National System of Vital Statistics, and it was a happy circumstance that he was able to carry the introduction of the new death certificate through to completion before his retirement.

the subject by the Dominion Bureau, and in 1933 it was considered desirable to proceed with the preparation of a new certificate. At this time, the Canadian Public Health Association, through the Section of Vital Statistics, expressed its willingness to assist in furthering the preparation of the new certificate. Similar cooperation was extended by the Department of Epidemiology and Biometrics in the School of Hygiene, University of Toronto. A committee was formed by this department to study the certificate from the physician's standpoint. In March, 1934, the findings of this study were presented to the Dominion Bureau of Statistics. As a result of a conference, tentative recommendations were approved, which were discussed later with the Department of National Health and certain suggestions incorporated. The Section of Vital Statistics of the Canadian Public Health Association was represented by Dr. Eugene Gagnon, Chairman of the Section.

The committee was, at this time, formally appointed by the Canadian Public Health Association and its membership extended to include provincial representatives. It was asked to consider the civil as well as the medical portion of the certificate. At this time also Mr. Macphail communicated to the Provincial Departments the progress which had so far been made and requested their suggestions and opinions. The recommendations of the committee were presented at the Annual Meeting of the Canadian Public Health Association held in Montreal in June, 1934, and were adopted by the Association. These recommendations were received by the Dominion Bureau and presented to a meeting of the Provincial Departments, being accepted with certain minor changes and receiving also the approval of the Department of National Health.

Form of the new certificate.—Essential information required in the registration of deaths falls naturally into two categories—civil and medical. As the accompanying article by the Committee of the Canadian Public Health Association presents the medical certificate, reference here is made only to the changes in questions appearing on the civil side of the form. As physicians are sometimes called on to complete the whole certificate, their attention is called to the following changes.

Length of stay.—Previous confusion in regard to the information desired is avoided by the new wording "Length of stay in city, town, or township where death occurred".

Residence of deceased. — Mortality statistics for municipalities can never be reliable so long as no correction is made for persons dying in local hospitals, whose place of abode is outside the local area. A clear and precise statement of residence is therefore of great importance, and, to facilitate this, residence has been definitely stated on the revised form to mean "usual place of abode, Post Office address in rural parts not sufficient".

Nationality of deceased.—By this is meant *citizenship*. The insertion of this question before "Racial Origin" has certain administrative value. It also assists in clarifying the meaning of "Racial Origin" and removes any resentment on the part of those who might object to the latter question.

Occupation of deceased.—Two questions have been added to this section which, it is thought, will ultimately prove of value to medical statistics, *e.g.*, in the case of diseases which might be industrial. These questions are "Date deceased last worked at this occupation", and "Total years spent in this occupation".

These changes in the questions on the civil side of the death certificate will provide additional information of value to the state and to the medical profession, and will assist in improving the reliability of mortality records as an index of the differential incidence of disease.

The steps by which the new certificate has been developed are an illustration of the cooperation accorded to the Dominion Bureau of Statistics by the medical profession, the Provincial Health and Registration Departments, and the Department of National Health in a common purpose.

THE PHYSICIAN AND THE NEW CANADIAN DEATH CERTIFICATE

BY R. D. DEFRIES, M.D., D.P.H. AND A. H. SELLERS, B.A., M.D., D.P.H.,*

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Every physician appreciates in a general way the importance of the collection, tabulation, and analysis of mortality returns, but it is only when he desires the facts relating to a specific disease that he appreciates the serious limitations which surround the obtaining of reliable statistical data. As a medical student he may have used, in answer to examination questions concerning the value of vital statistics, such terms as "the bookkeeping of public health" or "the appraisal of our progress in medicine" without a realization of his dependence on such statistics in everyday practice. In such a practical question as the value of insulin, consideration must be given to the mortality from this disease in the years prior to insulin and after its general use. At once the reliability of

* For the Committee on the Certification of Causes of Death, Section of Vital Statistics, Canadian Public Health Association.

the data must be considered before any conclusions can be made. The data may not be reliable because the form of the certificate has not elicited from physicians satisfactory statements. If several causes of death are entered on the certificate, rules of practice for the selection of the one cause which is to be tabulated must be used by the recording bureau. These rules are not uniform in various countries, and are subject to change from time to time in any country. It is not surprising, therefore, that efforts have been made in various countries during recent years to improve the form of the certificate of death, with the objective of obtaining from the physician a clear statement of his opinion as to the cause of death.

The value of our death statistics depends on their portraying accurately the related facts, particularly the medical findings. Accurate mortality records are of great sanitary importance, and progress in medicine and public health has been substantially aided by knowledge derived from statistics of cause of death. Next to the birth certificate, the death certificate is the most important record made of man. In the future, guidance in public health will, as in the past, come from these records, and it is of great importance that effort be made to improve the reliability and accuracy of the statements on the medical certificate. The achievement of this aim depends on the physician understanding clearly the questions relating to cause of death on the certificate and the general principles of death certification. It is essential also that the physician's statement be as complete and as accurate as is possible, for it must be remembered that *our statistical mortality data can never be more accurate than the statements of the medical practitioners.*

Defects and Difficulties of the Old Standard Form of Medical Certificate

The form of the question as to the cause of death on the old certificate is, in general, that which was used in Great Britain and the United States for many years. Following a committee's report to the League of Nations Health Committee in 1925, steps were taken in Great Britain and the United States to prepare a new certificate. Such was introduced in England in 1927 and in the United States in 1930. As previously stated, the effort in each country in preparing a new certificate has been directed particularly towards a rewording of the physician's statement of cause of death, to avoid the confusion which arises out of the use of the terms "cause of death" and "contributory causes". Although efforts had been made to clarify the situation by defining for physicians the term "cause of death" as the disease or injury which initiated the train of events leading to death, yet much confusion has continued to arise. In reply to the question "cause of death?" physicians were still prone to record the terminal condition rather than the cause so defined. The use of such adjectives as "primary" or "underlying" has not been satisfactory in conveying to the physician what is desired if a true picture of the mortality experience is to be presented. The truth of this is indicated by the large number of medical certificates which have been found unsatisfactory when first submitted. Frequently, as many as one out of every seven certificates has to be returned for additional information. This situation has arisen, in part, out of the unsatisfactory form of the old medical certificate. These defects may be summarized as follows.

1. The precise meanings of "cause of death" and "contributory cause" were not clear. The confusion which has arisen may be illustrated in the case of death from peritonitis following appendicitis. In such cases, physicians often merely state "peritonitis" as the cause of death on the medical certificate, without mention of its origin. These certificates are usually returned for additional information as to the cause of the peritonitis. In this particular case, of course, the proper classification would be to appendicitis. Further, in the case of a child with measles, dying of bronchopneumonia, many physicians record bronchopneumonia as the "cause of death", whereas, in accordance with the definition of cause of death given above, and to obtain a true picture of measles' mortality, the death must be classed under "measles".

2. The old certificate did not distinguish satisfactorily between contributory causes which are *related to* the disease causing death ("the disease or injury which initiated the train of events leading to death") and those which are considered *contributory* factors but *independent* of the disease causing death. For example, if the physician recorded three morbid conditions, one of which was a complication or sequela of another and the third an entirely independent disease, no provision was made in the wording of the physician's medical statement to permit him to clearly express his opinion on this essential point.

3. The old certificate failed to elicit specifically the necessary information concerning violent and accidental deaths, and did not ascertain the possible puerperal character of the death.

The New Standard Certificate

Realizing the importance of the introduction of a new form steps were taken in 1929 by the Dominion Bureau of Statistics to obtain the opinions of the provincial authorities as to the form of a new certificate.

Although it may seem a relatively simple matter to formulate the questions as to the cause

of death in a manner that will clearly present to the physician the exact information desired for accurate medical statistics, the experience of committees in various countries which have studied this question indicates that it is a very difficult problem. Appreciating the necessity of having this matter carefully considered by members of the medical profession, and with the hope that as a result of a careful study and trial some suggestions might be offered to the Dominion Bureau and the provincial authorities in formulating a new certificate, a committee was appointed in the fall of 1933 with the cooperation of the Department of Epidemiology and Biometrics of the School of Hygiene, University of Toronto. This committee subsequently was formally established as the Committee on the Form of the Medical Certificate of the Vital Statistics Section of the Canadian Public Health Association.

Careful study was given to the certificates in use in various countries, and several trial certificates were prepared. These were submitted to trial through the cooperation of a group of seventy-five physicians in Ontario and the superintendents of various hospitals in Montreal and Toronto. As a result, the committee made a detailed report to the annual meeting of the Canadian Public Health Association in Montreal in June, 1934, with the recommendation that the form of the questions relating to the cause of death adopted in England and Wales was, in their opinion, most satisfactory. The additional questions on the medical certificate were likewise recommended as essential to the proper recording of the death from a medical standpoint. Following a conference of the Dominion Bureau with representatives of the provincial authorities, the recommended form of the certificate was accepted by all the provinces with minor changes. The new Canadian certificate has already been distributed for use in several of the provinces and in others the new certificate will be in use before the close of the year.

The new form which has been adopted for use is clear and logical and embodies all the considerations which experience has shown to be necessary to the intelligent selection of a single cause for tabulation in a clear and logical manner. The form of the questions relating to cause of death resembles very closely that on the medical certificate which has been in use in England and Wales since 1927, and embodies the general plan of the form suggested by a sub-committee of the Health Committee of the League of Nations in 1925. This new form establishes beyond doubt (if it is not misused) the two relationships between causes which are of value in vital statistical practice, namely, (1) relationship of causation and (2) relationship of importance. Unlike the old form, therefore, a statement of duration, which can so infrequently be given accurately by the attending physician anyway, is unnecessary. It also effectively separates the contributory causes, such as complications (*e.g.*, gangrene in diabetes), from an independent contributory cause, such, for example, as chronic nephritis.

The certificate is divided roughly into two parts—civil and medical. The former contains all the necessary data concerning age, sex, date and place of birth, racial origin, nationality, occupation, etc. The medical side of the form furnishes space for a statement of cause of death and ancillary questions relating to pregnancy, surgical operations and deaths from violent or accidental causes.

(a) *The civil side of the new certificate.*—The facts recorded on the civil side of the certificate are of great legal and social importance. Besides this, certain of them are specifically of medical interest. Age, sex, race, occupation, and place of residence are all variables which play a definite part in the epidemiology of disease. As in diabetes, for example, these facts are of great value to the medical profession, and when studied along with the causes of death provide invaluable information on the differential incidence of disease.

(b) *The medical certificate.*—The outstanding change in the new medical certificate of death is the form of the questions relating to the cause of death. This section of the certificate bearing these questions is reproduced herewith.

CAUSE OF DEATH

I

Immediate cause (a) .....
Give disease, injury or complication which caused death, **not** the mode of dying, such as heart failure, asphyxia, asthenia, etc.
due to

Morbid conditions, if any, giving rise to immediate cause (stated in order proceeding backwards from immediate cause). (b) .....
due to
(c) .....

II

Other morbid conditions (if important) contributing to death but **not causally related to immediate cause.** .....
.....

The morbid conditions relating to death are divided on the certificate into two groups. In Group I are those related to the "Immediate Cause" of death, and in Group II those not causally related thereto.

In a large number of cases only one cause of death need be recorded on the certificate. Where, however, two or more are entered the confusion which formerly arose between "cause of death" and "contributory" or "secondary cause", need not now occur. The procedure in certifying cause of death on the new form may be outlined as follows:

(a) Name first the "Immediate Cause" of death, *i.e.*, the disease, injury or complication which caused death (not mode of dying or terminal condition). This is statement (a) under Group I.

(b) Then give other morbid conditions (if any) of which it was the consequence, in order of causal relationship, stating the most recent one first and then others in order, (b) and (c) under Group I.

(c) Entries under Group II should be reserved for "other important contributory morbid conditions" in those instances particularly in which death was due to a combination of maladies, none of which would have been fatal alone. In such cases, the physician's judgment alone can afford guidance to the tabulator. In this connection it is emphasized that only those morbid conditions which in the mind of the physician were actually important contributory factors should be recorded. For example, if a patient who has pernicious anæmia, but is on adequate liver therapy and is not experiencing any disadvantage due to his disease, subsequently dies of coronary thrombosis, or cerebral hæmorrhage, there is nothing to be gained by entering the pernicious anæmia even as an unrelated contributory cause. It is much more important to record a hypertension or chronic degenerative myocarditis if such were present.

The way in which the questions relating to cause of death on the new certificate should be answered, and the value of the new certificate in presenting clearly the physician's opinion of the cause of death are illustrated by the following examples.

A patient in whom a provisional diagnosis of carcinoma of the large bowel has been made, was operated upon and a resection done. Erosion having occurred prior to operation, acute diffuse peritonitis developed and the patient died three weeks after operation.

The new certificate would elicit the information that peritonitis followed operation for carcinoma of the large bowel. As there were no other contributory morbid conditions in this case, no statement under II is needed, thus:

CAUSE OF DEATH

I	
Immediate cause Give disease, injury or complication which caused death, **not** the mode of dying, such as heart failure, asphyxia, asthenia, etc.	(a) Acute diffuse peritonitis due to (b) Carcinoma of transverse colon
Morbid conditions, if any, giving rise to immediate cause (stated in order proceeding backwards from immediate cause).	due to (c) .....
II	
Other morbid conditions (if important) contributing to death but **not causally related to immediate cause.**	.....
	.....

The importance of qualifying all tumours, (1) as to malignancy or non-malignancy, and (2) as to their site, is appreciated by all physicians, but is frequently omitted, requiring the return of the certificate for such information.

When two or more independent morbid conditions are present, the ambiguity of the old form was even more serious. If a patient has both diabetes and tuberculosis, the physician is the only one in a position to say which of these two actually should be recorded as the cause of the death of his patient. Such being the case, the varying interpretation of cause of death and contributory cause on the old form led to much confusion, as some physicians would enter under "cause of death" the same statement that others would place under "contributory cause". The new certificate offers a solution of this problem, for it places entirely on the physician the choice of the major cause—major in the sense that he feels it to be the one deserving tabulation as the cause of death in the records. The following example illustrates these points.

A patient who for a number of years had chronic nephritis developed a strangulated inguinal hernia and was operated upon for this condition. Some time subsequent to the operation, he developed bronchopneumonia and died.

Presuming that the physician felt that the chronic nephritis was an important factor in this case, but that the strangulated hernia was of first importance, the medical certificate of cause of death would appear as follows:

CAUSE OF DEATH

I	
Immediate cause Give disease, injury or complication which caused death, **not** the mode of dying, such as heart failure, asphyxia, asthenia, etc.	(a) Bronchopneumonia
Morbid conditions, if any, giving rise to immediate cause (stated in order proceeding backwards from immediate cause).	due to (b) Operation due to (c) Strangulated inguinal hernia
II	
Other morbid conditions (if important) contributing to death but **not causally related to immediate cause.**	Chronic nephritis .....

The significance of "due to" is largely one of time relationship, implying causation in this broad sense.

Confusion also has arisen frequently regarding accidental deaths. The new certificate assists the physicians, coroners and medical examiners in giving a clear statement in such cases:

An old lady accidentally fell while walking across the street, fracturing the neck of the right femur. She had adenomata of thyroid without hyperthyroidism and generalized arteriosclerosis. Ten days after the fall, she developed bronchopneumonia and died shortly afterwards.

The adenomata of thyroid clearly have no part in the picture. Neither, probably, had the arteriosclerosis, except in so far as age *per se* is concerned. The attending physician alone could decide this point. But the immediate cause of death was the bronchopneumonia and it clearly must be considered to be consequent upon the fracture of the femur and confinement in bed, and this in turn "due to" the accidental fall. The medical statement of cause of death would then be as follows:

CAUSE OF DEATH

I	
Immediate cause Give disease, injury or complication which caused death, **not** the mode of dying, such as heart failure, asphyxia, asthenia, etc.	(a) Bronchopneumonia
Morbid conditions, if any, giving rise to immediate cause (stated in order proceeding backwards from immediate cause).	due to (b) Fracture of femur due to (c) Accidental fall on the street
II	
Other morbid conditions (if important) contributing to death but **not causally related to immediate cause.**	Generalized arteriosclerosis

The procedure in certification may then be summarized briefly thus: If the physician feels that all the essential features of his case can be presented in a single statement, this is entirely satisfactory. Such a statement is made under heading I, on the first line designated (a). If, however, such a simple statement is not adequate, he has the opportunity of recording further information, either on line (b) and (c) under heading I or under II, according as the conditions to be recorded are, respectively of related or independent origin in so far as the first statement [on (a)] is concerned. This information is sought so that the selection of the cause for tabulation may be made in the light of the certifier's viewpoint.

It is, of course, essential that physicians be familiar with accepted medical terms as used in the International List of Causes of Death. To facilitate this, the Dominion Bureau has issued a Pocket Reference, and is now preparing a small reference manual as a ready guide to the proper use of the new certificate.

Supplementary medical questions.—In respect to the remaining questions of the medical certificate the following brief explanations may be of value.

Pregnancy and childbirth.—Wherever pregnancy or parturition is, or has been, in the opinion of the attending physician, a contributory factor of importance in the fatal outcome, the nature of the conditions should be given in the statement of cause of death. All diseases resulting from childbirth, miscarriage, or abortion should be qualified by the word "puerperal", so that no ambiguity may arise, *e.g.*, "puerperal septicæmia". Septicæmia following childbirth and that following abortion should be distinguished. The question "If a woman, was death associated with pregnancy?" serves to supplement the preceding statements, or where the death is not certified to a puerperal cause, but pregnancy or parturition preceded death, it secures the opinion of the doctor as to any possible association.

Surgical operations.—It is desirable to know whether or not the death was associated with an operation, and to know the condition for which the operation was undertaken, as well as the findings at operation, so that death may be attributed to the proper cause.

Violent and accidental deaths.—It is essential that it be clearly stated whether the death was due to accident, suicide, or homicide, and to state the manner of occurrence and nature of the injury. The data here again supplement that given in statements of cause of death.

ACHIEVING THE OBJECTIVE

To make Canadian mortality statistics a more accurate expression of the opinions of the medical practitioner respecting the causes of death in their patients, the importance of each individual death certificate must be realized by the profession. If the physician clearly understands the simple principles on which the questions relating to cause of death on the new form are based, as illustrated by the examples presented in this article, he will not only find certification of deaths simpler and more satisfactory, but he will find that it gives him the opportunity, not heretofore possible, of expressing clearly his opinion as to the cause of the death of his patient. With the hearty cooperation of the profession the new certificate will fulfil its purpose.

Medical Economics

THE REPORT OF THE COMMITTEE ON ECONOMICS

The following comments on certain points brought out in the Report of the Association's Committee on Economics were prepared by Dr. Alfred Cox, at the request of the *Journal*. Doctor Cox is known to many of our readers as a former very active and efficient Secretary of the British Medical Association. He is a recognized authority on Medical Organization, Medical Economics, and Medical Legislation. He knows Canada and our Association. His remarks, therefore, will be received with interest and attention. It is pleasing to note that he regards the Report as a comprehensive and excellent piece of work.

COMMENTS BY ALFRED COX, O.B.E., M.A., M.B., LL.D., *London*

I think this Report reflects enormous credit on those responsible for it. It is a conspectus of the health insurance situation which seems to me more complete, practical, and informative than anything else I have read—and I have read a good deal on this subject. The references in the present notes are to the pages of the Report in brochure form.

Medical Care of the Indigents—page 4.—In this we, in Britain, are distinctly ahead of Canada. The medical care of the indigents is recognized as a responsibility of the State. When they are treated at home they are treated either by salaried Public Assistance Doctors, who are nearly always local private practitioners, or, in some areas, we are now getting the right of free choice recognized, and poor persons can go to any doctor who has put his name on the list as being willing to treat them on the terms agreed. We think it is entirely wrong that people who have fallen by the way, often through no fault of their own, should be made to feel they are in a class apart when they are ill.

Medical Care of the Well-to-Do—page 5.—This is a very difficult subject. The method of charging the well-to-do a fee which will make up for the services which are rendered for nothing or at less than cost price cannot be defended logically, but it dies hard. For example, there are certain Public Medical Services in this country run by the profession itself locally and intended to give a family doctor service to the dependents of insured persons who do not come under the insurance system. The contributions have been fixed on a scale which is supposed to eliminate charity, but there are lots of doctors in these services who cannot get away from the idea that, because it is a contract, therefore there must be something cheap or in the nature of charity about it, but at the same time the claim is made that it is a first-class family doctor service. My own belief is that the days of the family doctor are numbered unless he is willing and able to provide a really good service on a contract basis. The number of people in any country who are able to pay on the fee system for all the medical assistance they ought to have is very limited. The choice for the future is between a large extension of contract practice, either voluntary or compulsory, and a State-regulated, probably salaried, doctor system.

The point is well taken, under "Medical Care of the Middle Class", that the sliding scale tends to penalize the thrifty, who, because of their thrift, appear to be, and actually are, more capable of paying.

III. Health Insurance—page 7. (Quotation from Progress Report from British Columbia).—The opinion as to the inadequacy of voluntary sickness insurance is very important, and I think it is well founded. The Public Medical Services, to which I have previously referred, are voluntary. In London it is computed that there are 4 million dependents of insured persons for whom this service was primarily intended. After eight years of work this service has only managed to get a little over 30,000 members, in spite of the inducement of paying by weekly instalments, which are collected at their homes. The number of people who drop out through various causes is very large, and I am convinced that the only way *to make sure* that people of that particular economic status will get medical assistance is *by compulsion.* As suggested a little lower down in the Report, the real value of the voluntary plan is to blaze the trail for something more complete.

Top of second column—page 7.—Speaking with a full sense of responsibility, I am certain that the conditions of medical practice in this country under Health Insurance are better than they were. I compare the system with the bad old days of club-doctoring when the doctor was under-paid and at the mercy of a Committee of the Club, and was almost forced by the nature of his payment to give as little as he could in the way of service. And there was no free choice; the patient had to accept the doctor elected by the Committee. When you compare that with a system wherein a man can choose his own doctor, when everything reasonable in the way of drugs is provided, and when the

doctor feels that he has a real interest in the government of the whole system, the difference is enormous—and the pay is about double (in *real* money) what it was in club practice.

XIV. What is an Adequate Medical Service? Point 2 of "The Six Essentials" is very important. The growing cost of complete medical attention leads nearly everybody, except the really rich, to regard medical care as a luxury, unless they are frightened. And if there is anything honest in all this talk about the need for prevention, it is obvious that the present system hardly touches *individual* preventive medicine.

Point 4.—The above is dealt with also under point 4. I think it is time the medical profession (apart from that section which is engaged in Public Health) should give up talking about prevention amongst individuals, because they ought to see that there is no inducement under the present system of private practice to teach prevention. I have as high a belief in the altruism and essential decency of our profession as any man has, but you cannot get away from the fact that in ordinary private practice the doctor is only paid when the patient is ill, and the patient, with due regard for his pocket, does not go near the doctor *unless he thinks he is going to be ill* or *is ill.* No system of payment by fee will ever get over this.

I don't pretend that, up to the present time, Health Insurance has done much in this direction either, but it ought to, because it is based on the right principle. The doctor is paid whether his patient is well or ill. It takes some time for doctors who have been accustomed to the old bad contract arrangement to get into the new atmosphere, but I believe the newer generation is beginning to see the matter in its right light, and, with a little pressure from the public and from the medical organizations, the time will come when doctors who are being paid by contract will enter with enthusiasm into the idea that they ought *to try to keep their potential patients well.* Of course, the public need education too, but that is going on all the time, and in due course we ought to see patients turning up for a friendly talk with their doctor and an overhaul, and the doctor telling them either that he is glad to pronounce them perfectly fit, or that he is glad they came when they did because he is much more likely to be able to do them permanent good than if they had not come until they were really ill.

XV. Consideration of some Criticisms of Health Insurance. Paragraph 4.—You are quite right in saying there has been no slackening of public preventive services in Britain under Health Insurance—quite the contrary. But as a matter of fact there has yet been no sign of that co-ordination between the two services—Insurance and Public Health—that there ought to be. The Public Health man is so obsessed with the idea that it is much more convenient to have his work done by somebody who is directly under his orders that he rarely thinks of employing the local practitioners. For example, in many areas diphtheria immunization is going on; in some of them the Medical Officer of Health is using full-time assistants at centres, but in a few of them (which are increasing in number) the Medical Officer of Health sees that he can popularize immunization very much better by getting it done by family doctors. The private doctor must learn to regard himself, and be treated as a member of the team which is trying to improve the health of all the community.

Page 15—Medical Certification.—I hope there won't be any hesitation in rejecting the idea that incapacity ought to be certified by a special staff. This seems to me to be a most dreadful confession of absence of backbone. I can understand it on the part of men who ought to be behind a counter and not in a profession, and whose only idea is money, but I cannot understand it being suggested by a man with any self-respect, particularly when he knows that, if he does refuse the service, he may offend and lose one of his patients, and perhaps his family, but not a collection of people as he did in the old club days when he might lose three or four hundred people at once. He keeps his self-respect and, very often, the patient comes to the conclusion, before he has had time to change his doctor, that it isn't a bad thing to have a man who knows his own mind. And can it be seriously suggested that an outside man, who is always looking for malingering, is likely to be the best, not to mention the most sympathetic, judge of the situation?

Criticism 8.—The point that neither disease nor treatment can be standardized is very well taken and put. As you say, it is very annoying to the administrator, but it is well that even the administrator should be brought up against the facts of human nature from time to time.

Medical Care of Indigents in Canada—page 17.—Reading this section is rather depressing, and the lack of arrangements for the medical care of indigents can only be excused on the ground that, as a new country, this question has not been a particularly pressing one. But you will have to tackle it as you become more industrialized, and treatment cannot be based on the charity of the medical profession, flattering though this may be.

Attitude of the Profession in Manitoba—page 20.—It is true to say that the depression has brought the profession together more than it has ever been. My experience is that there is nothing like trouble for tightening up organization. The fight for the Insurance Act in this country did more to *make* the British Medical Association than any other single factor.

Page 21. Comment, second paragraph.—The supersession of the family doctor by a group of

specialists is something which is happily as yet comparatively unknown in our country. And I cannot think that the system alluded to in this paragraph is a good one, unless the human body and human nature are entirely different in Canada from what they are here. Unless we are to assume that the ideal is that when people are ill they ought to go to a nursing home or hospital (which to me is a damnable doctrine, because, when I am ill I want to be amongst my family and feel that I am somebody who is more than a mere patient or a unit in an institution), the family doctor must be essential as the general adviser of the family, as the man who can best deal with those relatively minor things which, after all, form the bulk of medical practice.

The idea of a patient selecting his own specialist is grotesque to me. In the first place, the patient would have to make a diagnosis, and I never forget a story which was told me in the United States after my last visit to Canada. I asked a man in New York who was his family doctor, and he said he hadn't one, though he had 19 doctors for his family during the past year, for they called in the man they thought was most likely to be able to deal with the symptoms, and he didn't think the mortality rate had been higher than could be expected! After I had expressed my astonishment at rational beings accepting such a system, he said it was a vicious circle because it was difficult to say which was most responsible—the desire of every doctor to become a specialist and get specialist's fees, or the desire of the public to get what they think the highest advice without going through any intermediary. I said that to me the intermediary, if he was the right kind of man, was the most important link in the chain.

The point is that, if the general practitioner wants to revive the family doctor system, he must *believe in it himself* and make himself thoroughly competent, and the men who teach him must believe in it. The most convinced believer in the "family doctor" I ever met was Sir Clifford Allbut. At the present time he (the general practitioner) is far too much obsessed with an inferiority complex as regards specialists. When I am ill I hope I shall get into the hands of a thoroughly sound general practitioner, who, if he thinks I need a specialist, will see that I get the best man.

Canadian Medical Association Plan—page 32.—I am very glad to see the insistence on the responsibility of the medical profession for giving leadership in this matter, and the Canadian Medical Association seems to me to have done its duty.

XXIV. Administration—page 33.—I strongly support your paragraph in which you draw attention to the fact that public health has encroached on fields left untouched by the general practitioner. We have had more medical "grousing" over this subject than over almost anything else in this country, and even yet there are members who tell me the "British Medical Association has not resisted" this encroachment, when it was obvious to all responsible persons that the Public Health services were doing work which the general practioner either cannot do or had done very imperfectly. How could a responsible medical organization resist it?

Page 35, middle of first column.—You are quite right in suggesting that when general practitioners engage in the practice of preventive medicine, the number of doctors will be much greater than has been considered adequate in the past. Since my early youth I have listened to complaints about the way in which medical work was being diminished by the actions of the public authorities. The answer to that is that there are far more doctors employed now than there ever were, in nearly every country. It is true that an increasing number are employed as salaried people in the Public Health service, but in this country the number of general practitioners in proportion to the population has not diminished. The politician in the long run will settle what doctors the country needs and in what directions they should be used, and our business is to advise the politicians to the best of our ability how to do his job in matters in which we know better than he can.

XXIX. Payment to Medical Practitioners.—Don't forget our experience in trying two different methods of payment of insurance doctors. Under our Act the profession in any locality can choose the method of payment which it thinks best—either by capitation, or by payment for service rendered. But the dominating factor is that there is only a certain amount of money in the pool, and that no "wangling" of the method of payment will give a greater sum to the local profession as a whole. It is a question of distribution, and the two areas (Manchester and Salford) which tried payment for services rendered, after a few years of gallant struggle to maintain in their dogged way their own particular view, gave it up and adopted capitation. The other system gave a great deal of clerical work and, unfortunately, put temptation in the way of doctors to put in as many services as possible so as to get as big a share as they could of the pool. And again, let me emphasize that in my opinion the capitation system or the salary system are the only two ways in which you can get the doctor to take an interest in individual preventive medicine, and the only way which will encourage patients to go to the doctor before they are really ill.

There is nothing new about these remarks, I am afraid, but they will at any rate show that I have read your Report with interest and perhaps some of them may be useful.

A HEALTH INSURANCE SCHEME FOR ALBERTA

Dr. A. C. McGugan, Director of Preventive Medicine, in Alberta, is making a tour of the various centres of the province, outlining what is contemplated in the Health Insurance Scheme. One or two units are to be set up, from which it is hoped that data may be gathered which will help perfect the system. It appears that before a unit is set up, which is supposed to contain from 18,000 to 30,000 people, it must be clear that the project can be carried out with the assistance of $3.22 per capita from the Government. The district must provide and pay in to the Government Commission in Edmonton $11.28 per capita, and the Government will pay the Commission $3.22 per capita as above. While the amount needed is based on a per capita cost, the collections are based on income earners; therefore each income earner will have to pay the equivalent of the district's per capita share of three persons. Every person in private industry must pay from his funds to the local council $2.82 per month, or $33.83 per year. If a man employs help he must pay 81c. per month per man, or $9.67 per year, and must deduct from the wage earner $2.01 or $24.16 per year. All these sums are in addition to the amounts that are being deducted from industry and labour by the Workmen's Compensation Board. Municipalities do the collecting, and are allowed 2 per cent for the purpose. There will be complete preventive medicine, covering the control and prevention of communicable diseases, periodic physical examination, public sanitation, maternal, infant and child welfare clinics, and these will include pre-natal clinics, well baby clinics, clinics for children of pre-school age, clinics for children of school age, periodic health examinations for all school children, vaccination and inoculation.

All persons who are under the scheme will have free, in a public ward, such hospitalization as is deemed necessary by the attending physician; he may have a semi-private or private ward, without further cost. He receives all general medical services, including obstetrics, also minor and major surgery, as well as laboratory service, x-rays, biochemical tests, and all other diagnostic aids free of charge. Under certain conditions, he may be referred for treatment to specially trained men outside the health unit.

The free dental service includes extraction, filling and straightening services, but does not include plates, bridge-work, etc.

Drugs or appliances needed or ordered by the physician are supplied free, but the patient must pay for eye-glasses.

The Commission is to be composed of three persons appointed by the Government, with an Advisory Board in each district. This Board is made up of one councillor from each municipal district in the Health Unit. They, in turn, will appoint from their number, a Board of Reference composed of three persons who will decide all matters in dispute, regarding who is entitled to services. An appeal can be taken to the Commission. When it comes to a dispute between the attending physician and the patient as to the kind of treatment a patient should receive there is a Medical Board of reference to deal with this matter. Physicians are to be paid fees agreed upon as between the Government Commission and the College of Physicians and Surgeons.

At the present session of the legislature a special Act is being presented to provide for the establishment of Health Units, Section II of which empowers the council by by-law to make provision for the supplying of medical care and attention to residents. The by-law must be submitted to and approved by at least two-thirds of the proprietory voters voting thereon, and every contract made in pursuance thereof has no force unless approved by the Minister of Health. The effect of the above amendment is to make the municipal doctor's scheme apply to incorporated villages and towns.

Another interesting clause is Section 13, which provides for the imposition of a minimum tax of four dollars, for the purpose of school taxation and the imposition of a tax for school purposes, of four dollars per annum on every resident in a school district who has resided therein at least one month, who is gainfully employed, and is not assessed on the assessment roll.

G. E. LEARMONTH

ALLERGY TO CHICLE: PRELIMINARY REPORT.—A. I. Kleinman reports the occurrence of allergic manifestations following the use of chewing gum. Two patients exhibited marked positive local skin reactions when tested intradermally with extracts of chicle. In one case Cooke's postulates were satisfied. These require (1) that there should be a positive skin reaction with the suspected substance; (2) a history of exposure to the substance in question; and (3) the ability to reproduce the symptoms when the patient is exposed to it. In the other case obvious difficulties were presented in establishing a positive clinical history. The marked positive skin tests, however, associated with systemic reactions, led the author to suspect strongly that this patient also had a genuine chicle allergy. It was also proved that chicle does not act as a skin irritant producing non-specific reactions by the fact that out of twenty-five allergic patients only one showed a moderately positive skin reaction.—*J. Am. M. Ass.*, 1935, **104**: 455.

Men and Books

MAIMONIDES THE PHYSICIAN*

BY A. B. ILLIEVITZ, M.D., C.M., M.Sc.,

Montreal

Moses Maimonides (1135-1204), also known as RaMBaM or Rabbi Moses ben Maimon and, in Arabic, Abu Amram, Musa ibn Maimun, was not only a Talmudist, philosopher, astronomer and teacher who commanded the respect of his and other generations but also a busy and able physician of note and a writer on medical subjects. It is with the medical side of this versatile scholar that this article deals.

The success Maimonides achieved in many fields of learning, and especially in the field of medicine, is of particular interest when one realizes the difficulties and conditions under which he was born, reared and lived. With his contemporary, the celebrated Arabian philosopher and physician, Averroes (1126-1198) he shared the persecution for views which conflicted with the teachings of the day. Unlike his contemporary, on account of the intolerable anti-Jewish hatred he had to lead a dual life, assuming an outer mask, discovery of which meant certain death. Such conditions existed in his native town, Cordova, and conditions had not changed when his family migrated to Fez. He eventually settled at Fostat, where his fame as a physician was recognized, and he became the court physician to the Sultan Saladin.

That Maimonides was ambitious no one will deny, but his love for scholarship and religious wisdom was for their own sake. It is for this reason that he wrote: "Let thy fixed occupation be the study of the Law, and thy worldly pursuits be of secondary consideration". As a Jew he was not bound by the Tertullian teachings that "Investigation since the Gospel is no longer necessary", nor was he to follow the opinions in relation to the teachings of Mohamet. If his views conflicted with his own teachers and people he knew that the Talmud teaches: "The rivalry of scholars advances science", and Maimonides was interested in learning for its own sake.

From a medical point of view Maimonides' greatness does not lie in his contributions to medicine, nor in his writings, but in the practical application of the medicine of his day. He taught his brethren and his patients how to think, how to reason; he also showed them how to live. His medical works cannot entirely be separated from his philosophical works. Affections of the body, he states, should be treated by the physicians but the affections of the "soul" should be treated by a haham (a clever man). This is one of the earliest hints of psychotherapy.

"Those who are not acquainted with anatomy", says Maimonides, "think that nerves, arteries and veins are the same, and were it not for the study of anatomy in which we were busily engaged we also should not know the difference". "The chapters which I have composed", he writes on another occasion, "I do not attribute to myself, but I have selected and collected them from the works of Galen, and from his sayings concerning the writings of Hippocrates. I have not quoted him verbatim, as I have done in my previous opuscula, having taken special care to elucidate those obscure passages of Galen, where, in his attempt to explain the theories of Hippocrates, the latter's words seem to be confounded with his own."

All Maimonides' writings depended on original and independent judgment. The sources were the "Written Law", the Talmud, the Geonim and his teachers Isaac Alfasi and Joseph ibn Migas. In addition there were many non-Jewish sources. In the interpretation of the various authorities he relied upon his own judgment. When his judgment conflicted with that of the Talmud or other authorities, he made a ruling on his own authority and based on his own medical knowledge. Thus, when he addressed the scholars of Lunel, he pointed out that it was impossible (in his opinion) to renounce one's own reasons or to reject recognized truths because of some conflicting statements in the Talmud or the Midrash. He also discarded all precepts which depended on the belief in demons or other superstitious views, and, similarly, many things forbidden by the Talmud as injurious to health his medical knowledge led him to consider harmless.

His views were of course attacked. Some of his opponents were merely envious; others were sincere, but essentially from a religious point of view; others felt that in view of the fact that he did not consider it essential to cite his sources, he made it difficult, nay even impossible, for scholars to verify his statements. Yet, Maimonides had high regard for some authorities. He refers to Hippocrates as the "Head of Physicians". Hippocrates was probably the only non-Jew upon whom the Jews conferred the title "The Pious".

Maimonides, both as a physician and as a philosopher, wielded a great deal of influence upon medical education. Rabbi Judah ben Samuel ben Abbas, about the year 1250, in out-

* This article is apropos in view of the fact that March 30, 1935, marks the eight hundredth anniversary of the birth of Maimonides.

lining the course of education of a boy, in a work called "Illuming the Path", stated that at about the age of eighteen one is ready to taste the sweetness of the honey of the sciences, and recommends a work by Maimonides as introductory to the works of Avicenna, Galen and others on medicine and surgery.

Maimonides' advice to one of his pupils, by the name of Joseph Aknin, is worthy of note: "A physician should begin with simple treatment, trying to cure by hygiene and diet before he administers drugs. He advocated a thorough training in the arts and sciences, illustrating its advantages in his metaphor, "He who can swim may bring up pearls from the depth of the sea; he who cannot swim will be drowned".

In a letter to Jonathan of Lunel he points out how his work was greatly responsible for his neglect in giving more time to the study of the Law: "Although from my boyhood the Torah was betrothed to me, and continues to hold my heart as the wife of my youth, in whose love I find a constant delight, strange women whom I just took into my house as her handmaids become her rivals and absorb a portion of my time". Medicine was one of these "strange women".

Maimonides' greatness as a physician is attested by his contemporary 'Abd-el-Latif, the celebrated Arabian traveller and physician, who by his studies demonstrated that Galen's osteology must be wrong, asserted that his stay in Egypt was in part due to his anxiety to see three men there, one of whom was Musa ben Maimon, the "Eagle of the Doctors". In comparatively recent years Sir William Osler referred to Maimonides as the "Prince of Physicians", and the poet, Alsaid ibn Sina Almulk, sang his praise in verse, which translated, reads as follows.

> Galen's art but the body heals,
> Maimonides', the soul as well,
> Ignorance, a sickness quite real,
> To his great wisdom fell
> A prey.—If Luna would submit
> To his art, he would rid
> Her of her spots and defects,
> Restoring her from waning effects.

His fame as a physician was world-wide. His attachment to Saladin caused him to refuse the position of court physician to Richard I of England. For Saladin's private use he wrote a treatise on personal hygiene, the Latin version of which was known as "Tractatus de Regimine Sanitatis".

He wrote many books on medical subjects, but the books which were most cited by mediæval writers were:

"Al-Sumum wal-Mutaharriz Min Al-Adwiyyah al-Kitalah", a treatise in two volumes on various poisons and their antidotes. Moses ibn Tibbon translated it into Hebrew under the title "Ha-Ma'amarha Nikbad", it was also translated into Latin by Armeng and Blasii in 1305, into French in 1865 and by Steinschneider into German in 1873.

"Fi al-Jamah", a treatise in three parts on sexual intercourse, dedicated to Malik al-Mustafir, Sultan of Hamat and nephew of Saladin. It was translated into Hebrew by Zerahiah ben Isaac under the title "Ma'amar 'al Ribbui ha-Tashmish".

"Fi al-Bawasir", a treatise in seven chapters on hæmorrhoids, translated into Hebrew under the title of "Ha-Ma'amar bi-Refuat ha-Tehorim", and into Spanish under the title "Sobre los Milagros".

"Makalah Fi al-Rabw", a treatise on asthma, which was translated into Hebrew by Samuel ben Benveniste and Joseph Shatibi.

"Fusul Musa" is an imitation of the aphorisms of Hippocrates. It was translated into Hebrew under the title "Pirke Mosche" by Zarahiah ben Isaac and Nathan ha-Meati. It is a collection of about fifteen hundred medical principles.

Maimonides wrote many essays on hygiene. His correspondence and some consultations were compiled under the title "Teshubot She'elot we-Iggarot". His "Responsa" were later translated into Hebrew under the title "Pe'er ha'Dor".

In a letter to Samuel ibn Tibbon written in September, 1199, Maimonides describes his own mode of life, his preoccupation with religious, communal and medical works. He starts with a eulogy of Samuel's father, Judah (the father of translators). "I did not know that he had left a son . . . . Blessed be He who has granted a recompence to your learned father, and granted him such a son; and indeed not to him alone, but to all wise men . . . . ." He proceeds by praising ibn Tibbon's Hebrew style and his knowledge of Arabic and by giving some advice to Samuel. "Let me premise one canon. Whoever wishes to translate, and purposes to render each word literally, and at the same time to adhere slavishly to the order of the words and sentences in the original, will meet with much difficulty. This is not the right method. The translator should first try to grasp the sense of the subject thoroughly, and then state the theme with perfect clearness in the other language. This, however, cannot be done without changing the order of words, putting many words for one word and *vice versa*, so that the subject be perfectly intelligible in the language into which he translates". In writing about himself he continues: ". . . . Now God knows that in order to write this to you I have escaped to a secluded spot, where people would not think to find me, sometimes leaning for support against the wall, sometimes lying down on account of my excessive weakness, for I have grown old and feeble.

"But with respect to your wish to come here to me, I cannot but say how greatly your visit would delight me, for I truly long to commune with you, and would anticipate our meeting with even greater joy than you. Yet I must advise you not to expose yourself to the perils of the voyage, for, beyond seeing me and my doing all I could to honour you, you would not

derive any advantage from your visit. Do not expect to be able to confer with me on any scientific subject for even one hour either by day or by night, for the following is my daily occupation.

"I dwell at Misr (Fostat) and the Sultan resides at Cairo; these two places are two Sabbath days' journey distant from each other. My duties to the Sultan are very heavy. I am obliged to visit him every day, early in the morning; and when he or any of his children, or any of the inmates of his harem, are indisposed I dare not quit Kahira, but must stay during the greater part of the day in the palace. It also frequently happens that one or two of the royal officers fall sick, and I must attend to their healing. Hence as a rule, I repair to Kahira very early in the day, and, even if nothing unusual happens, I do not return to Misr until the afternoon. Then I am almost dying with hunger. I find the antechambers filled with people, both Jews and Gentiles, nobles and common people, judges and bailiffs, friends and foes —a mixed multitude, who await the time of my return.

"I dismount from my animal, wash my hands, go forth to my patients, and entreat them to bear with me while I partake of some slight refreshment, the only meal I take in the twenty-four hours. Then I attend to my patients, write prescriptions and directions for their various ailments. Patients go in and out until nightfall, and sometimes even, I solemnly assure you, until two hours and more in the night. I converse with and prescribe for them while lying down from sheer fatigue, and when night falls I am so exhausted that I can scarcely speak.

"In consequence of this, no Israelite can have any private interview with me except on the Sabbath. On that day the whole congregation, or at least the majority of the members, come to me after the morning service, when I instruct them as to their proceedings during the whole week; we study together a little until noon, when they depart. Some of them return, and read with me after the afternoon service until evening prayers. In this manner I spend that day. I have here related to you only a part of what you would see if you were to visit me.

"Now, when you have completed for our brethren the translation you have commenced, I beg that you will come to me, but not with the hope of deriving any advantage from your visit as regards your studies, for my time is, as I have shown you, excessively occupied."

In Biblical and Talmudic times the knowledge of the art of healing was transmitted from father to son. There is strong evidence of this custom in the Maimonides family. Maimonides' brother-in-law, Abu al-Ma'ali, was a physician and employed in the court of Saladin. Of the descendents of Maimonides the following were physicians: his son Abraham (1185-1254); his grandson David (1212-1300); and the two sons of the latter, Abraham Maimonides II (1246-1310) and Solomon (1248-?).

The influence of Moses ben Maimon is incalculable. So much so that medical writers still insist in referring to the beautiful prayer of Markus Herz (1747-1803) as the Oath and Prayer of Maimonides. It has been definitely established that Maimonides did not write the "prayer". Christians, and Moslems, as well as Jews, owe much to the clear and brilliant mind of the Jew, who for a long time wandered from place to place and who was denied freedom of thought and expression, not only by his religious persecutors but also by his own people with whom his views conflicted.

The fact that his theories were discussed, that his views were criticized and hotly resented was in itself a compensation, a fulfilment of the Talmudic saying that the rivalry of scholars advances science, for to him "The acquisition of knowledge is one of the highest forms of religion". Posterity has changed its attitude to the scholar of the twelfth century, but not so much for his influence in medicine as for his religio-philosophical teachings which influenced scholasticism in general and inspired men to think. Many great men, such as the philosopher Solomon Maimon, Spinoza, Moses Mendelsohn, Elias del Medigo, Albertus Magnus, Thomas Aquinas, Alexander of Hales and many others were affected by Maimonides.

Thus the verdict of posterity, "From Moses unto Moses there arose not one like Moses", is a just one.

BITOT'S SYNDROME.—Solares, reporting 4 cases of night blindness with xerosis, occurring in children aged from 4 to 8 years, describes in the horizontal meridian of the bulbar conjunctiva of each eye a dull white rugose triangle, with its base at the corneal margin, its surface frothy and thrown into folds by the movements of the globe. Pigmentation was present in the fundus in one case only. There was no other ocular abnormality, except that when measured by Wecker's scale light perception was found to be much reduced. Acuity and field of vision, mobility, sensation, and pupillary reactions were unaffected. The patients were found to be blind after sunset, and even with the moon at its brightest constantly stumbled. Inquiry into their dietetic regimen revealed excess of carbohydrates, with little or no meat, milk, or fats, except in one case, where there was pancreatic inadequacy which promptly yielded to pancreatic enzymes. On the diet of coffee, milk, olive oil, green vegetables, fresh fruit, boiled meat, bread, vermicelli, and rice, to which was added an artificial preparation of vitamins A and D, all symptoms had disappeared in a month.—*Assistencia,* Sept., 1934, p. 29; Abs. in *Brit. M. J.*

Association Notes

The Meeting at Atlantic City

Members of the Canadian Medical Association who plan to attend the joint meeting of the Canadian and American Associations at Atlantic City should make their reservations at the Haddon Hall Hotel at once. Accommodation is likely to be strained, and if the Canadians do not reserve their rooms reasonably early there is a danger that they may find themselves crowded out. Reservations should be made directly with the management of the hotel. The rates are as follows:

European Plan—room and bath—one person, per day, $3, $4, $6, $8; two persons per day, $5, $6, $8, $10.

The daily rate for three meals on the American Plan is $3.00.

Single meals on the European Plan are as follows: breakfast, $1.00; luncheon, $1.50; dinner, $2.00.

The Section of Military Medicine

The Section of Military Medicine was inaugurated at the annual meeting of the Canadian Medical Association held in Vancouver, in June, 1931, in response to a strong feeling among many members of the profession that such a section should be established. Lieut.-Colonel A. M. Warner, of Vancouver, presided at this meeting, and approximately 125 doctors were in attendance, representing practically every military district in Canada. Col. Warner briefly outlined the events leading up to the formation of the Section, stating that the idea originated with Col. J. T. Clarke, D.G.M.S. Colonel Clarke had promised to give the inaugural address at this meeting, but, owing to his unavoidable absence, his paper was read by Colonel Drum.

After the reading of Colonel Clarke's paper, it was decided that a definite program be arranged for the next meeting of the Section, to be held in Toronto in 1932, and that the following papers be arranged for: (1) a paper on "The mobilization of the medical profession in event of war"; (2) a paper on "The use and abuse of lethal gas in warfare, and means of defence therefrom"; (3) a paper on "The use of pathogenic bacteria in warfare, and means of defence therefrom."

For the following year, Col. W. B. Hendry and Major W. G. Cosbie, both of Toronto, were elected *Chairman* and *Secretary*, respectively.

The second meeting of the Section was held in the Royal York Hotel, Toronto, on June 22, 1932, when the Chairman, Col. W. B. Hendry, of Toronto, gave an address pointing out the value of having on file complete information with reference to every medical practitioner in Canada. This was followed by an address by Dr. E. S. Jeffrey, of Toronto, on "The responsibility of the Canadian medical profession in national defence";* and a paper by Dr. P. A. T. Sneath, of Toronto, on "The present status of gas in modern warfare".† After discussion on the above-mentioned papers, the following resolution was duly moved, seconded and carried:—

"That the Executive Committee of the Canadian Medical Association be asked to approve the following resolution, give such instructions, make such arrangements, and provide for such funds as are necessary to have it put into effect at the earliest possible moment:

1. That a complete survey be made of the medical profession in Canada, in order to obtain the following information concerning every graduate in medicine:

   Name, address, married, single, age, occupation, degrees, where graduated, special post-graduate training, militia training, military experience, rank, preference as to service at home or abroad in the event of war.
2. That cooperation of the provincial medical associations be asked in carrying out this survey.
3. That a special file be provided for each graduate and be kept up to date. This file shall contain the above information, and shall also contain the expressed opinion of the executive as to the capacity in which he is best fitted to serve on mobilization.
4. That these files when complete be deposited with the Canadian Medical Association, and cross-indexed alphabetically, provincially, and as regarding specialties."

At this meeting it was also suggested that it would be advisable to form a Section of Military Medicine in connection with each of the Provincial Medical Associations, and that the different universities might be approached with reference to giving lectures to students on matters pertaining to the responsibility of the medical profession in time of war.

No meeting of the Section of Military Medicine was held in connection with the annual meeting of the Canadian Medical Association in Saint John, in 1933.

At Calgary, in 1934, the Section of Military Medicine met on June 21st, immediately following a luncheon for Overseas-Officers and Officers of the Non-Permanent Active Militia, given by Lieut.-Col. J. N. Gunn, D.S.O., of Calgary. Lieut.-Col. Gunn acted as Chairman, and Major J. A. Murray as Secretary. About one hundred and twenty officers were present.

Major F. C. Clarke, M.C., was called upon by the Chairman and gave a paper on "A glimpse of the past, what of the future?"‡

After the reading of this paper, Col. Gunn

* Published in the *Journal*, 1933, **29**: 195.

† See the *Journal*, 1933, **29**: 640.

‡ See the *Journal*, 1935, **32**: 71.

stated that Major Clarke had been one of his officers overseas, who, as in this particular case, although not in the best of health, was always ready and willing to carry out any duty assigned to him. The paper was then thrown open for discussion.

Colonel A. E. Snell, C.M.G., D.S.O., Director-General of Medical Services, opened the discussion. He referred to the excellence of the paper which had just been given and to the fact that it brought back memories, pleasant and otherwise. He spoke of the part to be played by field ambulances in future wars, with particular reference to the part to be played by air ambulances. Experiments were being made in England, and an aeroplane was being built by manufacturers who had all the requirements in mind. The French had made use of the aeroplane in evacuating wounded in Morocco. So far the Cavalry Field Ambulance was the only thing they had in mechanized ambulances, and these were sufficient to follow tanks or armoured car brigades. He further cited an instance where the French, by means of aeroplanes, had been able to clear 800 casualties a distance of about two hundred miles in a few hours, which would have taken the Field Ambulance four days. He, however, pointed out that there were certain difficulties in air transportation, such as the greater tendency to hæmorrhage, hernia, etc., and it had been found that, so far as the patient was concerned, an altitude of 7,000 feet should not be exceeded.

Sir Frederick Banting was the next to discuss the paper. He began by stating that there should be no misconception of the next war, and gave warning of the conditions under which another war would be fought, if one should come. "I should hate to see such measures introduced; but, if they are, we must be prepared to combat them." Sir Frederick made reference to the use of germs, such as cholera germs, by a potential enemy. He made further reference to the perfection which the aeroplanes had already attained, without a pilot, but directed by mechanical control at a distance.

The next speaker was Col. J. T. Clarke, C.B.E., former Director-General of Medical Services, but now Director-General, St. John Ambulance Association. He complimented his namesake on the excellency of his paper, and then took up the question of Mobilization of Medical Officers in the event of a future general mobilization. He spoke of the disadvantage of taking officers into the Service in the order they applied, as had been done in the late war, the result being that hospital staffs were denuded, universities crippled, and, in some instances, people in towns and villages had been left without proper medical facilities. He referred to a resolution which had been prepared by himself, with the approval of the Defence Council at Ottawa and which had been brought before the Canadian Medical Association meeting two years ago at Vancouver.

The following resolution was then moved by Col. Clarke and seconded by Lieut.-Col. A. R. Hagerman,—

"WHEREAS the mobilization in 1914 recruited the medical men as Officers in the C.A.M.C. more or less in the order in which they applied, resulting in—

1. The denuding of the staffs of many hospitals of most of their specialists such as radiologists, surgeons, oculists, laboratory men, etc.;
2. The serious impairment of the staffs of some of our medical colleges, and
3. The almost total abolition of efficient medical and health services in many of our towns, villages, and country districts,

BE IT THEREFORE RESOLVED that the Canadian Defence Council be asked to devise some such plan as the following, which would automatically begin to function as soon as mobilization is ordered in the future:—

1. That the recruiting for Officers of the C.A.M.C. in each Military District shall be governed by a committee of three, consisting of the District Medical Officer and two Medical men of high repute and influence in the District, to be named annually by the Canadian Medical Association.
2. That this committee shall be held responsible for selecting suitable Medical men to fill the requirements of the Army, and also to leave suitable and sufficient Medical personnel to carry on successfully the civil hospitals, the Medical colleges, and the civil Medical and Health work of the District.*

The Chairman then asked if there was any discussion on the motion before the meeting. Lt.-Col. F. A. C. Scrimger, V.C., of Montreal, spoke to the motion, and stated that he thought the resolution should go first before the Executive of the Canadian Medical Association. To this proposal, Col. Clarke, the sponsor, replied that such was the intention. There being no further discussion, the motion was put to the meeting and carried unanimously.

The Chairman, Lt.-Col. Gunn, then stated that he wished to pay tribute to Major Harold Orr, of England, for the work he had accomplished along disinfecting lines and how he had made it possible to rid not only the Canadian Army but also the British to a great extent of vermin by the special processes he had devised. In his opinion "No man had done more for the soldiers' comfort during the whole of the Great War than Major Orr."

Col. John Gunn, C.B., of Winnipeg, in a short humorous speech, voiced the appreciation of the large gathering for the kindness extended to the Military Medicine Section of the Canadian Medical Association, by his namesake, Lt.-Col. Gunn, of Calgary, in providing such an enjoyable luncheon. The meeting then adjourned.

* This Committee was intended to have advisory functions only, so we are informed. [ED.]

Hospital Service Department Notes

Increase in Approved Internships in Canada

The 1935 revision of the list of hospitals in Canada which are approved for internship by the Department of Hospital Service of the Canadian Medical Association has been issued, and it is noted that there has been a steady increase in both approved hospitals and available internships. Since the issue of the 1934 list the number of approved hospitals has increased from 33 to 38 and the number of available internships in these institutions has risen from 459 to 557. This number includes certain final-year internships, as in certain medical schools the final year is an internship year, and associated teaching hospitals reserve a proportion of available internships for final-year students. Hospitals placed upon the approved list during 1934 are: the Woman's General Hospital, Montreal; Hôtel-Dieu of St. Joseph, Montreal; Vancouver General Hospital, Vancouver; and the Provincial Royal Jubilee Hospital, Victoria. In addition a "recommended" list is issued, comprising public hospitals which can provide their interns with an excellent training, although for one reason or another they do not at present fully comply with the provisions set forth in the basis of approval. Owing to several hospitals being transferred to the approved list this group has been reduced from 15 to 12 hospitals and internships from 92 to 47. Twenty approved and 5 recommended hospitals have appointments available to women.

An analysis of the intern services now available in Canadian hospitals promises well for the future of the practical training of recent graduates in medicine. During the past few years there has been a decided improvement in the facilities for intern training in many of our public hospitals. Clinical services have been much better organized; "intern committees" of the medical staffs have arranged demonstrations and lectures, set up reading clubs, and, where possible, rounded out the training with desirable affiliations. The autopsy percentage—one of the best indices of the scientific spirit of a hospital—has shown an excellent improvement. One hospital, Hôpital St. Luc of Montreal, had an autopsy percentage on all deaths of 75 and if unexamined coroners' and inspector of anatomy's cases be excluded, post-mortems were held on 93 per cent. The Edmonton General Hospital has increased from a negligible figure three years ago to 42 per cent. The Saskatoon City Hospital, with but rare autopsies a few years ago, now reports 17 per cent for the year.

Up to date libraries have been developed for the interns' use, and housing and recreational arrangements have been improved. Above all there has been a noticeably increased desire on the part of the members of hospital staffs to help these young apprentices. There is a commendable trend toward the freer discussion of treatment and diagnosis, and to teach the interns by precept and by example the "art" of medicine. And in return the young graduate fresh from the medical school can be of inestimable help and stimulus to the older practitioner on the staff. These improved conditions, linked with the decrease in available opportunities in United States hospitals, have increased markedly the number of Canadians taking internships in Canada, although even so the number of desirable positions would seem to outnumber the supply of young men and women available for them.

Hospitals in Canada which are Approved for Internship by the Department of Hospital Service of the Canadian Medical Association

The hospitals which are herein specified as "approved" provide their interns with the clinical and other facilities, the organization and the opportunities for study and experience which are outlined as essential in the Basis of Approval for Internship of Hospitals in Canada prepared by the Department of Hospital Service of the Canadian Medical Association. These 38 hospitals, with 557 internships, can furnish recent graduates with highly desirable opportunities. The above number includes a certain number of final year internships, as noted on the list.

Because of the frequent desire of young graduates in both Canada and the United States to take internship in the other country, it has been arranged that this list of acceptable internships and that of the Council on Medical Education and Hospitals of the American Medical Association be reciprocally approved. Arrangements have been made also whereby credit for an internship in an approved Canadian hospital will be given by the National Board of Medical Examiners.

As there are a number of good hospitals in Canada which can provide their interns with an excellent training, although, for one reason or another, they do not fully comply with the provisions of the Basis of Approval, it was the desire of the Committee that certain of these hospitals be placed temporarily upon a "recommended" list. This group of 12 hospitals, with 47 internships, is appended herein.

Further information with respect to internships in Canadian hospitals, to the Basis of Approval, or concerning senior internships or residencies in specialties may be obtained by writing to Dr. Harvey Agnew, Secretary, Department of Hospital Service, Canadian Medical Association, 184 College Street, Toronto 2.

All communications intended for the Department of Hospital Service of the Canadian Medical Association should be addressed to Dr. Harvey Agnew, 184 College Street, Toronto.

APPROVED GENERAL HOSPITALS

Name of Hospital	Location	Bed Capacity (excluding bassinets)	Distribution of Beds						Intern Service						
			Medical	Surgical and Gynecological	Obstetrical	Pædiatric	Communicable Diseases including Tuberculosis	Other Departments	Number of Interns excluding residents	Women interns accepted	Examination or Appointment	When Selected	Internship Begins	Salary paid (first year)	Rotation or Straight
Victoria General Hospital	Halifax	250	50	115	—	15	—	70	12	No	Ex.	April	April 30th	Yes	Rotation
Saint John General Hospital	Saint John	345	54	101	45	31	40	74	8	2	App.	Prev. fall	July 1st	Yes	Rotation
Hôpital du St. Sacrament	Quebec	275	100	100	25	50	—	—	2	Yes	App.	June	July 1st	Yes	Rotation
Children's Memorial Hospital	Montreal	260	110	100	—	Yes	43 Tbc.	7	11	All	App.	Dec. 15th	July 1st	No	Straight
Hôpital Notre Dame	Montreal	630	100	130	20	60	130 C.D.	190	12-15	Yes	App.	March	June 15th	Yes	Both
Hôpital Ste. Justine	Montreal	500	99	117	40	460	60 C.D.	184	18	Yes	App.	Feb. & July	June 15th	No	Rotation
Hôtel-Dieu of St. Joseph	Montreal	350	100	110+40	—	—	—	50 urol. + 50	16	No	App.	February	June	No	Rotation
Hôpital St. Luc	Montreal	436	80	200	36	Yes	—	120	23	No	App.	Mar., Apr.	July 1st	Yes	Rotation
Montreal General Hospital	Montreal	589	92	137	—	29	—	331	50	Yes	App.	Dec. 15th	July 1st	No	Rotation
Royal Victoria Hospital	Montreal	730	122	194+94 gyn.	124	24	—	172	45	No	App.	January	July	No	Straight
Woman's General Hospital	Montreal	190	58	62	43	35	—	27	8	No	App.	February	August 1st	Yes	Rotation
Ottawa Civic Hospital	Ottawa	540	380	Yes	80	80	—	80 E.E.N.T.	17-19	No	App.	January	July 1st	Yes	Rotation
Kingston General Hospital	Kingston	400	95	105	28	36	33 Tbc.	103	12	No	App.	January	June	Yes	Rotation
Grace Hospital	Toronto	121	Yes	Yes	33	—	—	Yes	4	No	App.	By Easter	July 1st	Yes	Rotation
Hospital for Sick Children	Toronto	400	Yes	Yes	—	400	Yes	Yes	17	Yes	App.	Jan. or Feb.	July 1st	No	Rot. in med.
St. Joseph's Hospital	Toronto	250	100	80	34	16	20 Tbc.	Yes	6	2	App.	Jan. & May	July 1st	No	Rotation
St. Michael's Hospital	Toronto	633	Yes	Yes	Yes	—	—	Yes	21 jr. 7 sr.	1	App.	December	July 1st	No	Rotation
Toronto East General Hospital	Toronto	139	44	67	28	—	—	—	4 grad. + 2	No	App.	April 1st	July 1st	Yes	Rotation
Toronto General Hospital	Toronto	1154	240	424	60	—	20 Tbc.	410	46	2	App.	January	July 1st	No	Both
Toronto Western Hospital	Toronto	282	80	80	44	—	—	Yes	10 grad. +4 u.g.	No	App.	December	July 1st	Yes	Rotation
Hamilton General Hospital	Hamilton	618	144	193	165	78	Yes	Yes	16 jr. 6 sr.	No	App.	December	July 1st	Yes	Rotation
St. Joseph's Hospital	London	300	70	90	47	46	—	—	4 grad. + 1	1	App.	Jan. 15th	July 1st	Yes	Rotation
Victoria General Hospital	London	400	90	60	30	80	—	140	8 jrs. 4 srs.	2	App.	Dec. 1st	July 1st	Yes	Rotation
Metropolitan General Hospital	Walkerville	126	66 with S.	Yes	29	18	10 Tbc.	Yes	3	1	App.	January	July 1st	Yes	Rotation
Hôtel-Dieu of St. Joseph	Windsor	113	30	46	20	17	—	—	3	No	App.	May	July	Yes	Rotation
MacKellar General Hospital	Ft. William	203	78	65	30	30	—	—	3	Yes	App.	January	June 1st	Yes	Rotation
Children's Hospital	Winnipeg	130	35	35	—	130	10 Tbc.	20	7	2	App.	January	June 1st	Yes	Rotation
Winnipeg General Hospital	Winnipeg	631	168	293	35	36	14 surg. tb.	50 E.E.N.T.	27	Yes	App.	December	June 1st	No	Rotation
St. Boniface Hospital	St. Boniface	778	126	227	35	50	Yes	Yes	4 sr. 14 jr.	1	App.	February	June 1st	No	Rotation
Regina General Hospital	Regina	407	60	109	33	35	30 C.D.:18 Tb.	152 (27 psych.)	8	Yes	App.	Prev. fall	July 1st	Yes	Rotation
Saskatoon City Hospital	Saskatoon	304	198 with S.	Yes	26	40	20 Tbc.	Yes	8	Undef.	App.	Dec.-Jan.	July 1st	Yes	Rotation
Edmonton General Hospital	Edmonton	137	83 with S.	Yes	18	36	—	—	2	No	App.	Dec. & June	Jan. and July	Yes	Rotation
Misericordia Hospital	Edmonton	175	58	69	30	10	8 Tbc.	20	2 grad. + 2	No	App.	January	July 1st	Yes	Rotation
Royal Alexandra Hospital	Edmonton	490	100	100	50	60	50 C.D.:30 Tb.	100	10 grad. + 6	No	App.	Jan. 31st	May 1 & July 1	Yes	Rotation
University of Alberta Hospital	Edmonton	355	109	105	17	52	20 Tbc.	17	10	Yes	App.	January 1st	July 1st	Yes	Rotation
St. Paul's Hospital	Vancouver	336	Yes	Yes	34	20	—	Yes	4	No	App.	January	July 1st	Yes	Rotation
Vancouver General Hospital	Vancouver	1089	704 with S.	Yes	110	105	170 Tbc.	Yes	35	2	App.	Nov. Dec.	July 1st	Yes	Rotation
Provincial Royal Jubilee Hosp.	Victoria	346	116	92	30	31	41 Tbc.	—	4	No	App.	December	July 1st	Yes	Rotation

RECOMMENDED HOSPITALS

Homoeopathic Hospital	Montreal	90	25	40	25	—	—	—	4 grad. + 2	One	App.	Feb. 1st	July 1st	Yes	Rotation
Ottawa General Hospital	Ottawa	330	58	124	20	65	—	63	9	No	App.	February	July 1st	Yes	Rotation
Christie Street Hospital	Toronto	545	199	150	—	—	36 Tbc.	160	3	No	App.	April	July 1st	Yes	Rotation
Brantford General Hospital	Brantford	181	36	36	20	34	20 C.D.	35	2	No	App.	January	July 1st	Yes	General
Westminster Hospital	London	625	75	10	—	—	40 Tbc.	500	6	No	Ex.	May	July	Yes	Rotation
St. Catharines General Hosp.	St. Catharines	150	30	64	20	24	10 C.D.	Yes	2	Yes	App.	Early in year	July 1st	Yes	Rotation
St. Joseph's Hospital	Port Arthur	149	49	58	28	8	2 Tb.: 2 C.D.	—	1	Yes	App.	June	July 1st	Yes	General
Grace Hospital	Winnipeg	119	54 with S.	Yes	65	30	—	—	3	Yes	App.	Varies	June 1st	No	Rotation
Misericordia General Hospital	Winnipeg	225	60	115	40	10	—	—	6	No	App.	Nov. & Jan.	June 1st	No	Rotation
Moose Jaw General Hospital	Moose Jaw	180	48	56	20	12	10 C.D.:10 Tb.	24	2	Yes	App.	Feb. & Mar.	July 1st	Yes	Rotation
St. Paul's Hospital	Saskatoon	230	50	118	20	20	20 C.D.: 6 Tb.	—	5	No	App	November	June	Yes	Rotation
Grey Nun's Hospital	Regina	200	48	72	35	25	—		2	No	App.	Feb. 1st	July 1st	Yes	General

Medical Societies

The Academy of Medicine, Toronto

The annual Library and Historical Night of the Academy of Medicine, Toronto, was held on January 8th. The meeting was well attended by many of the representative Fellows, and in the gathering were a large number of invited guests, including ladies. The President, Dr. M. H. V. Cameron, in introducing the speakers, explained the purposes of the Library and Historical Night, and reviewed briefly the work which had been done in bringing together the valuable possessions which are in the library.

Mr. Thomas T. Rolph then formally presented to the Academy the portrait of his father, the Hon. John Rolph, (1793-1870). Mr. Rolph in his address recalled several incidents in the life of his father, when he was head of the Toronto School of Medicine, which were of great interest. He said for example that at one time his father gave all the lectures in the curriculum to his sixty-three students.

The Chairman of the Library Committee, Dr. F. A. Clarkson, spent a short time reviewing in an interesting way a number of the recent and valuable accessions.

The chief address was given by Dr. H. B. Anderson on "The Life and Times of James Macaulay, M.D., M.R.C.S. (1759-1822)", which contained an enormous amount of information, with a most interesting account of the development of Upper Canada following the Revolutionary War. Dr. Anderson dwelt particularly upon the happy personal relations that existed between Governor Simcoe's family and that of Dr. Macaulay. That the subject of his address had played no small part in the country's affairs at that time can be seen from the character of his appointments. He was Garrison Surgeon, Upper Canada, 1791; Senior Hospital Officer and Surgeon to the Forces in British America, 1803 to 1817; Deputy Inspector-General of Hospitals, 1812 to 1817, and first Chairman of the Medical Board of Upper Canada, 1819 to 1821.

Following his address, Dr. Anderson presented to the Academy a very fine water-colour portrait of Dr. Macaulay. This had been obtained through the courtesy of his great-grandson, the Very Reverend, the Dean of Chester, Frank Macaulay Bennett.

The Stated Meeting on February 5th was addressed by Dr. George Gilbert Smith, of Boston, the President-elect of the American Urological Association, on the subject of "The treatment of prostatic obstruction". Dr. Smith gave a critical survey of his own work in this special field. He dealt with the three principal procedures in this condition, namely, the suprapubic, perineal, and the transurethral resection method. It appeared from his remarks that he favoured the perineal route in the majority of cases. He preferred the resection for selected cases such as certain types of small fibrous prostate, carcinoma and median bar obstruction. He is using much less spinal anæsthetic than formerly, usually 70 to 75 milligrams. His paper will be published in full in the *Canadian Medical Association Journal.*

A very large number of the general profession as well as surgeons attended this meeting.

GILBERT PARKER

The Edmonton Academy of Medicine

A regular meeting of the Edmonton Academy of medicine was held at the Medical Building on February 6, 1935. Dr. H. K. Groff, President, presided.

Dr. Graham Huckle gave a very instructive paper on some practical points regarding injuries about the ankle. Dr. Huckle had prepared some very artistic drawings showing the various types of injuries to the ankle region, and dealt very fully with the management and treatment most suitable to each injury.

Dr. Harold Orr presented a paper on eczema, outlining present-day ideas on the subject. He discussed the histopathology, and pointed out that what has been called "eczema" and what has been called "dermatitis" are the same process. Heredity is the most predisposing factor, inasmuch as allergy looms so large in present day conception of eczema. He discussed very fully the question of secondary antigens and also the question of "contact eczema" in which the antigen is always primary.

HEBER C. JAMIESON

The Toronto Biochemical Society

The 34th meeting of this Society was held at the Ontario Research Foundation on January 25th. The following papers were presented.

1. A DIETARY FACTOR AFFECTING THE INTENSITY OF GLUCOSURIA IN PANCREATIC DIABETES, by C. H. Best, M. E. Huntsman and F. G. Young.

2. VARIATIONS IN THE EXCRETION OF ŒSTRIN DURING PREGNANCY, by S. L. Cohen, G. F. Marrian and M. Watson.—Free (active by injection) and combined (relatively inactive by injection) forms of both œstriol and œstrone present in pregnancy urines were estimated colorimetrically. The estimations were made on 24-hour specimens of urine collected from patients during different stages of normal pregnancy, labour, and immediately after parturition. The results of the estimations showed that during normal pregnancy there is a gradual increase in the amounts of combined œstriol and œstrone excreted in the urine, the rate of increase being at its maximum during the latter part of the 8th and the early part of the 9th months of pregnancy. During this

period the ratio of œstriol to œstrone excreted is 8 to 1, while the free œstriol and œstrone is excreted in amounts not exceeding 1 per cent of the respective combined forms. Just before and during labour there is a marked fall in the amounts of combined œstrone and œstriol excreted, while the percentage of free forms present in the urine increases. The urine excreted during the first 24 hours *post partum* contains œstrin to the extent of approximately one-quarter late normal pregnancy levels, with practically all of this in the free state. Changes in œstrin excretion similar to those occurring *pre partum* were observed to take place during pseudo-labour. These results may possibly be of some significance in the consideration of the mechanism of parturition.

3. THE TREATMENT OF AMENORRHŒA WITH PREPARATIONS OF THE ŒSTROGENIC HORMONES, by M. Watson.—Case records of a number of patients suffering from amenorrhœa who were treated with œstrone, œstriol or emmenin were presented. In some cases the condition appeared to respond to the treatment.

4. A NEW PHOSPHORIC ESTER FROM MALIGNANT TUMOURS, by E. L. Outhouse and E. J. King.—A study of the phosphoric esters of malignant tumours indicates that there are no hexosephosphoric esters present in the acid-soluble phosphates of tumours. The barium salt of a phosphoric ester has been isolated. The empirical formula $C_6H_{13}O_8N\,P\,Ba$ suggests that it is either a hexosaminephosphate or the phosphoric ester of a polysaccharide of hexosamine. The barium phosphate fraction consists of two organic phosphates: one precipitated by basic lead acetate, the other, about two-thirds of the barium soluble fraction, remains in solution.

G. F. MARRIAN, *Secretary.*

Special Correspondence

The London Letter

(From our own Correspondent)

Maternal mortality continues to be an important topic of discussion, and two events recently have brought out new aspects of the problem. One of these is a report by three expert obstetricians on their visit to Rochdale (a Yorkshire town famous among other things as the birthplace of John Bright) where a maternal mortality rate, prior to 1931 one of the highest in the country, has been reduced in recent years to a point below the national level. This has been achieved without any change in the personnel of those in charge of the midwifery work of the town, and it is concluded that a considerable part of the success of the effort can be traced to the improved practice of the doctors and midwives of the area. Two other points arise in this Rochdale experiment of some importance. The results were obtained despite a continuation of the period of economic depression affecting not inconsiderably the industries of the area, and, secondly, the women of the district were roped into the scheme in order that maternal ignorance might be eliminated as one of the factors in maternal mortality. The fact that there was apparently room for improvement in the midwifery of the area gives added importance to the second event of the past few weeks, namely, the report of the Joint Council of Midwifery proposing the establishment of a salaried municipal service of midwives. It is somewhat disturbing to learn from this report that the gross earning power of women practising midwifery regularly is only about £80 per annum. The new proposals seek to improve both the status and the standard of the midwife, while retaining domiciliary maternity work as the basis for the country as a whole. The scheme includes recommendations that the training of midwives should be lengthened, improved, and standardized, with compulsory "refresher" courses every so many years and general supervision of midwives by senior members of their own profession. There are many voluntary organizations for midwives which are working well and these will not be disturbed, but otherwise a salaried municipal service is suggested, on much the same basis as regards salary, pension, holidays, etc., as for other nursing members of the public health services. The whole report is full of important matter and is now before the Minister of Health.

Another report with important recommendations on quite another aspect of the medical services of the nation is the excellent findings of the British Medical Association's Committee on Fractures. The road accident problem alone adds to the urgency for better organization of the treatment of fractures, and while certain clinics, especially in areas benefiting from the traditions of Hugh Owen Thomas and Robert Jones, get uniformly better results than elsewhere, the degree of difference is a serious matter. For example, in a series of patients followed up from organized clinics with Pott's fracture the average period of disability was 11 weeks, and no patient was permanently disabled. In another, less fortunate, series, the average period of disability was 47 weeks and 30 per cent of patients were permanently disabled. The general recommendations include segregation of all fracture cases into special clinics, continuity of treatment, after-care and unity of control over the whole period. There are possible dangers in the too slavish following of continental patterns whereby unity of command may also entail that in the lifetime of the director of a clinic no advances from the outside world are allowed to enter into the methods used. With this possible

exception, the report is a masterly summary of the present state of the fracture problem as seen in the hospitals of the country, and the suggestions for solving it are worthy of serious attention.

Following the lead of the London County Council in appointing consultants to its hospital services, the Middlesex County Council authorities have advertised for medical, surgical and obstetrical specialists. This County is the one in which a large part of Greater London stands, and therefore its example is one watched with interest by other bodies and well under the eye of the central authorities at the Ministry of Health. In view of this certain new departures in the program are of great significance. For one thing the appointments are to be full-time, and it is stipulated that the specialist appointed shall be available for consultation with medical practitioners outside the various hospitals and all fees received shall be returned to the Council. This has caused grave concern among the younger consultants of London who are wondering how this will affect their income! Perhaps it is expected by this move to attract them to such posts, but there is one other disadvantage to be faced and this lies in the three months' notice which may terminate the appointments, leaving a man or woman who has devoted years to a specialty without any prospect of continuing as a consultant if dismissed from the Council's service. It is suggested that the new scheme is a step towards a state medical service, to include consultants and all. If this is so it is all the more important to secure that the detailed relationship between employed and employer shall be in order from the start.

ALAN MONCRIEFF.

121 Harley St.,
London, W.1.

The Edinburgh Letter

(From our own Correspondent)

At the recent annual meeting of the Corporation of the Royal Edinburgh Hospital for Mental and Nervous Disorders Professor Kennedy Henderson, the medical superintendent of the institution, stated that the number of cases of suicide in this country had increased considerably during the past decade. This he attributed mainly to the increasing strain attaching to modern conditions, and in particular to the competitive element inherent in city life. He made a plea for greater recognition of the work of the psychiatrist, pointing out that much could be done to solve the difficulties of people suffering from states of depression or emotional instability. The conditions, of which suicide is so frequently the outcome, are in many cases transitory states, which, with help and reassurance, can be completely readjusted so that the individual can again become a satisfactory member of society. There can be no doubt that the public require to be educated to a better appreciation of the results that can be obtained by modern methods of treatment of such conditions. The establishment of psychiatric clinics and wards in the general hospitals would do much to remove the prejudice that still lingers in the minds of many people as to the effectiveness of treatment in mental cases. It is a fact that the results now obtained in mental hospitals will bear comparison with those obtained in general hospitals. The early and adequate treatment of cases of mental illness has been hampered by the fact that the legal formalities attaching to admission to mental hospitals have tended to obscure the fact that the patients admitted to such institutions are primarily there for medical treatment. The desirability of bringing the procedure of admission to a mental hospital more into line with that obtaining in the case of general hospitals is now becoming generally recognized by the medical profession and by the public. The problem of mental health is one of the greatest issues of modern times, and the change that is taking place in the attitude adopted with regard to it is of very welcome significance. As physical and mental health are so closely inter-related it is of interest to note the extent to which the public is becoming interested in various schemes organized to promote physical health.

In Edinburgh University great attention is now paid to the physical condition of the undergraduates, and in 1930 a scheme of free medical examination was instituted. There has been a steady increase in the number of those who avail themselves of this provision. A report just issued on the subject states that almost without exception those who have been encouraged to take an interest in their physical health make steady progress year by year. It has been found of great value from a different point of view. On several occasions a student has been found to have a valvular lesion of the heart, but who nevertheless has taken part in such strenuous athletic activities as rugby football. The advice given has no doubt had the result of saving such persons from the risk of cardiac failure. Again, it is sometimes the experience of men who have successfully completed an honours' course with the intention of entering the Civil Service to find when they come up for medical examination that some condition, the presence of which they might not be aware, precluded them from being admitted to the service. Had the condition been discovered at the beginning of their university careers much valuable time and expense would have been saved.

The death has occurred of Dr. G. Matheson Cullen, the Pharmacologist to the Department of Health for Scotland. Dr. Cullen was a well known personality in Edinburgh. He was for

some time a magistrate and was also a member of the Boards of Management of the Royal Infirmary and the Royal Maternity Hospital. He was a man of great culture, a great student of theology, philosophy and anthropology. In his earlier days he published many articles, particularly one on Vesalius, the great Renaissance anatomist.

The importance of good housing as a factor in the promotion of health is one to which a great deal of activity is being devoted in these days. In Glasgow, for example, the Local Authority is tackling the matter in a very thorough way. A very large proportion of the population of the city still lives in two-roomed houses, but there is evidence to show that the transference to more suitable dwellings, such as are provided under the housing schemes, is already having a good effect on the health of the people. One of the difficulties in such a work is to ensure that what is gained by improved housing is not counterbalanced by a lowered standard of nutrition on account of the economic adjustments required to pay higher rents. It is accordingly satisfactory to find that in the report of the Medical Officer of Health for the city the statement is made that the percentage of school children showing definite signs of unsatisfactory nutrition was the lowest recorded during the past fifteen years. It is also stated, however, that both health and education would benefit by the introduction of a scheme of providing a milk ration in schools. It is noted that there has been an immense change for the better in the cleanliness, clothing and general condition of school children. The cultivation of health is now occupying a larger place in school life than was formerly the case. This is to be encouraged, as if the education provided is to be utilized to the best advantage it is necessary that the health of the children should be regarded as of primary importance.

R. W. CRAIG.

7 Drumsheugh Gardens,
Edinburgh.

DEATH

Thou the stern monarch of dismay,
Whom Nature trembles to survey,
O Death! to me, the child of grief,
Thy welcome power would bring relief,
Changing to peaceful slumber many a care.
And though thy stroke may thrill with pain
Each throbbing pulse, each quivering vein,
The pangs that bid existence close,
Oh! sure, are far less keen than those
Which cloud its lingering moments wits despair.

—Cardinal Bembo.

Letters, Notes and Queries

The Qualification of Specialists

To the Editor:

I see in one of the issues that the qualifying examination for specialists shall include examination of the College of Physicians and Surgeons of Canada.

May I respectfully call the attention of the College and others drafting plans for specialists that the Canada Medical Council between 1912 to 1920 was the highest qualifying examination in Canada. When others were taking the easier provincial tests a small number of us were trying seven of the hardest subjects and quite a few failed—in fact the anatomy and physiology examinations were the equal of any anywhere. If there had been a Royal College of Physicians and Surgeons of Canada at that time, I would have written that test. We qualified ourselves in general proficiency and having gone over the work so thoroughly once it should not be necessary to go over it again in the same detail.

The older practitioners before 1912 were eligible to the Canada Medical Council on application and payment of membership. This would be a good thing to do for those trying the Canada Medical Council before the Canadian College of Physicians and Surgeons was founded.

Nothing makes a specialist so much as years at a special work, because the constant doing makes one more and more proficient. This applies to surgery and everything else.

W. T. POCOCK.

Kearney, Ont.,
February 18, 1935.

The Diabetic Journal

To the Editor:

We wish to draw the attention of the medical profession to the Diabetic Association that has recently been formed in this country.

The Association exists primarily to provide an organization for the benefit and service of diabetics. It hopes to promote further study and research and to safeguard the general interests of diabetics. It aims at improving those social and physical disabilities which handicap particularly the poorer diabetic, by increasing facilities for treatment and care. Thus it will establish convalescent homes, schools and holiday homes for children, boarding houses and restaurants where diabetics can obtain suitable food, all of which are badly needed.

Information on these matters will be circulated among members by means of the

Answers to questions appearing in this column should be sent to the Editor, 3640 University Street, Montreal.

Diabetic Journal, the first number of which is now published. The subscription, which includes the journal, is one guinea per annum for richer, 2/6 for poorer members.

Membership is open to all diabetics and those interested in the subject. Most doctors especially interested, at hospitals and teaching schools, have already joined and given their support. The undersigned are acting as their representatives in writing this letter. A good start has been made under the presidency of Mr. H. G. Wells, but the existence of the Association must be unknown to thousands of diabetics. We would ask all doctors interested to join themselves, and/or bring the Association to the notice of their diabetic patients, inviting them to become members.

The idea that those who have found renewed health and strength from a particular treatment should help to bring the same to others less fortunate is one that appeals to many.

Full information, membership forms, journal, etc., can be obtained from the Secretary, The Diabetic Association, 59, Doughty Street, London, Eng.

E. E. CLAXTON
GEORGE GRAHAM
R. D. LAWRENCE
OTTO LEYTON
STELLA CHURCHILL.

London, W.1.,
February 14, 1935.

Topics of Current Interest

Hay Diets

In a recent issue of the journal, Dr. Martin Rehfuss* concluded, after a careful study of the available observations: "There is no evidence either in the literature or in my investigations to lead me to believe that proteins and carbohydrates are incompatible in the stomach. The danger of such teaching, based on a lack of scientific evidence, is manifest, and while it may be true that many individuals overeat and are presumably better by a reduction of carbohydrates, the unqualified acceptance of such a teaching can lead to the occurrence of serious malnutrition as well as to a lighting of tuberberculosis and old infections." It is worth while to emphasize this dictum of the gastro-enterologists because many purveyors of food, restaurants, department stores and others are ballyhooing the freak diets recommended by William Howard Hay,† who urges that starches and sugars "should not be eaten with the foods known as proteins and acid fruits." For several generations, Americans have been eating meat and potatoes and drinking milk, and have, as a result, produced some extraordinarily healthful and powerful human beings. Indeed, nature combines proteins and carbohydrates in practically all natural food substances. As is pointed out in a recent review of some of the books on the Hay diets, by Mary P. Huddleson, editor of the *Journal of the American Dietetic Association*, milk, one of nature's most perfect food substances, contains carbohydrates well balanced with protein; all vegetables, fruits and cereals, contain both carbohydrates and protein. A separation of proteins and carbohydrates in the diet is actually impossible, outside of a chemical laboratory, unless one chooses to subsist largely on egg white and dextrose. Incidentally, Miss Huddleson points out that a better title for the Hay diets would be "Hay-wire diets". These diet books, in order to make the foods they recommend palatable, would torture carrots into carrot matches, splinters or horns of plenty. Hundreds of the recipes demand egg yolks, without indicating what is to happen to the rest of the egg. Simple mixtures of lettuce and other greens are promoted with such extraordinary titles as "Fountain of Youth Cocktail," "Happy Highball," "Pale Moon Cocktail," "Easter Bunny Salad," "Parcel Post Asparagus," and "Apartment Chicken." It is urged, moreover, that the use of such salads will enable the consumer to escape the devils of neurasthenia, fatigue, fears, bodily distress and depressions. The promoters of "patent medicine" did much to add to the gaiety of the nation during their heydey in the public favour, but our present "Hay day" affords one of the most amusing spectacles ever presented to medical science.—*J. Am. M. Ass.*, February 2, 1935

* Rehfuss, M. E.: Proteins versus the carbohydrates: An inquiry into their gastric digestion, *J. Am. M. Ass.*, 1934, **103**: 1600.

† A reprint of an article on Hay, prepared by the Bureau of Investigation and published in *The Journal*, February 25, 1933, will be sent on request.

Synthetic Vitamin C Produces Unexpected Results

Synthetic vitamin C, called ascorbic acid, is producing unexpected conquests of disease, the British Association for the Advancement of Science was informed by Prof. A. Szent-Györgyi, the Hungarian chemist who played a major rôle in the artificial manufacture of this important vitamin. A certain kind of hæmophilia, the mouth disorder known as pyorrhœa, certain forms of hæmorrhagic nephritis, and several other diseases against which medicine was helpless, are seemingly being cured by ascorbic acid. It does not cure hereditary hæmophilia. "This is the more striking since these pathological conditions have not been thought to be connected with lack of vitamin." "These curative effects suggest that humanity is suffering much more gravely from a lack of

vitamin C than has hitherto been supposed.'' (Szent-Györgyi).

Disfiguring colorations of the skin brought on by illness, are also made to disappear by ascorbic acid. The skin of patients with Addison's disease can be bleached out again by the use of this substance.

The complete exploration of vitamin C was accomplished in record time. In the short space of two years vitamin C has been identified, its chemical structure determined, and it has been made synthetically in the laboratory. The pure, highly concentrated vitamin C acid has been made available for industry and medicine. Hungary (represented by Professor Szent-Györgyi, who is director of the Institute of Medical Chemistry, Szeged University) Switzerland, England, and other countries have worked together through their scientists in this great chemical conquest. ''It is pleasant to note that this unparalleled advance is due entirely to the closest and friendliest international collaboration''.

It is predicted that the rôle of ascorbic acid in life may be even more important than is now realized, for there seems to be no cell-life in higher organisms without ascorbic acid.—*The Diplomate,* 1934, **6**: 258.

Medical Ethics and New Methods of Practice

Gradual changes in the nature of our civilization have brought ever more complex problems for solution by the medical profession. As has been stated repeatedly in these columns, the ethical principles which guide medicine are fundamentally so sound that they may be adapted to any situation arising in medical practice, provided those concerned wish to observe the spirit of these principles. Nevertheless, physicians involved in new types of organization, such as contract practice, industrial practice, hospital practice, university practice, and the practice of medicine by lay corporations which employ physicians, have been brought before the judicial councils and committees on ethical relations of various medical bodies, because of infringements of these ethical principles. In some cases there have apparently been difficulties of interpretation. To overcome these difficulties, the Judicial Council of the American Medical Association at the Cleveland session presented three amendments to the Principles of Medical Ethics. These were heartily endorsed by the Reference Committee on Amendments to the Constitution and By-Laws and then adopted by the House of Delegates as guiding principles for organized medicine.

The term ''contract practice'' is anathema to the vast majority of individual practitioners in this country, yet contracts of all kinds are matters of daily life in all forms of industry. Conceivably, there are situations in which the practice of medicine under a contract may be necessary or desirable. In order to elucidate this phase of medical practice, the Principles of Medical Ethics, chapter II, article V, section 2, is now amended by addition of the following wording:

> By the term ''contract practice'' as applied to medicine is meant the carrying out of an agreement between a physician or a group of physicians, as principals or agents, and a corporation, organization or individual, to furnish partial or full medical services to a group or class of individuals for a definite sum or a fixed rate per capita.
>
> Contract practice *per se* is not unethical. However, certain features or conditions if present make a contract unethical, among which are: (1) When there is solicitation of patients, directly or indirectly. (2) When there is underbidding to secure the contract. (3) When the compensation is inadequate to assure good medical service. (4) When there is interference with reasonable competition in a community. (5) When free choice of a physician is prevented. (6) When the conditions of employment make it impossible to render adequate service to the patients. (7) When the contract because of any of its provisions or practical results is contrary to sound public policy.
>
> Each contract should be considered on its own merits and in the light of surrounding conditions. Judgment should not be obscured by immediate, temporary or local results. The decision as to its ethical or unethical nature must be based on the ultimate effect for good or ill on the people as a whole.

Group practice and clinical practice are also phases of medical work that have aroused opposition in many communities, because of the introduction of advertising methods and commercial promotion into their work. In some places groups or clinics have employed business managers, unfamiliar with the medical point of view, who have attempted to introduce unprofessional methods into medical practice. In order to establish the proper relationship between groups and clinics with the individual practice of medicine, the Principles of Medical Ethics will now contain the following statement:

> The ethical principles actuating and governing a group or clinic are exactly the same as those applicable to the individual. As a group or clinic is composed of individual doctors, each of whom, whether employer, employee or partner, is subject to the principles of ethics herein elaborated, the uniting into a business or professional organization does not relieve them either individually or as a group from the obligation they assume when entering the profession.

Regardless, however, of the damage wrought to scientific medicine by physicians who engage in contract practice or by groups of physicians competing with the individual practitioner, the worst possible type of new methods in medical practice is the incorporation by business men of organizations to engage in the practice of medicine, employing physicians on salaries and exploiting the services of these physicians unethically to the public. The most conspicuous

example of such an organization is the United Medical Service, Inc., which began a few years ago to advertise its services to the people of Chicago. Regarding such types of medical practice, the Judicial Council was definite. The Principles of Medical Ethics now contains the following statement:

> It is unprofessional for a physician to dispose of his professional attainments or services to any lay body, organization, group or individual, by whatever name called, or however organized, under terms or conditions which permit a direct profit from the fees, salary or compensation received to accrue to the lay body or individual employing him. Such a procedure is beneath the dignity of professional practice, is unfair competition with the profession at large, is harmful alike to the profession of medicine and the welfare of the people, and is against sound public policy.

As was stated in the introduction to these comments, these modifications of the Principles of Medical Ethics do not in any way modify the basic character of these principles. The Principles of Medical Ethics was established for the protection of the public primarily. Methods of promotion that sell medical practice on the basis of exaggerated claims, on a fee basis rather than the quality of service rendered, methods of practice that break down the intimate personal relationship that must exist between doctor and patient; methods that delegate the responsibility of the attending doctor to a group or a corporation or a business manager, carry with them a menace to the life and health of the people who are served.

Physicians will do well to familiarize themselves with these new statements of principle, now a part of the ethics of organized medicine. The young physician who is tempted by the offer of some commercial agency to enter into such schemes or combinations should bear in mind that he thereby jeopardizes his entire future in the practice of medicine and sacrifices the medical birthright for which he has already paid six or seven years of his life.—*J. Am. M. Ass.*, 1934, **103**: 263.

A doctor who, for want of skill,
Did sometimes cure and sometimes kill;
Contrived at length, by many a puff,
And many a bottle fill'd with stuff,
To raise his fortune and his pride;
And in a coach, forsooth, must ride.
His family coat long since worn out,
What arms to take was all the doubt.
A friend, consulted on the case,
Thus answer'd with a sly grimace:
"Take some device in your own way,
Neither too solemn nor too gay;
Three Ducks, suppose; white, grey or black;
And let your motto be, *Quack! Quack!*"—Graves.

Medico-Legal

V.

Marshall v. Curry*

Nova Scotia—Surgical operation—Surgeon's responsibility—Extension of operation while patient under anæsthetic—Patient's consent—Distinction between action for assault and battery and for negligence or malpractice—Statute of Limitations. [*R.S.N.S. 1923, c.238, s.2 (1) (a)*]—*Nova Scotia Medical Act.* [*R.S.N.S. 1923, c.113, s.32A, as enacted by 1930 (N.S.), c.34, s.1*].

This is an action for damages for negligence and assault in the course of a surgical operation. The judgment, rendered by Chisholm, C. J., in the Nova Scotia Supreme Court, is one of the most important in recent years upon the legal responsibility of the surgeon. Here is discussed in detail, with references to the jurisprudence, the duty of a surgeon who when operating for one condition discovers another which he had not foreseen, but which in his opinion endangers the health or the life of the patient.

The plaintiff alleged that he had employed the defendant to perform an operation for the cure of a hernia, and that, while doing so, and while the plaintiff was under the influence of an anæsthetic, the defendant without his knowledge or consent removed the plaintiff's left testicle. Further it was alleged that the defendant was negligent in diagnosing the case, and in not informing the plaintiff that it might be necessary in treating the hernia to remove the testicle, and finally that in removing the testicle in these circumstances the defendant had committed an assault upon the plaintiff.

As a question of fact the Court found that there had been no express consent by the plaintiff to the removal complained of, that there had been no implied consent in the conversations that took place between the plaintiff and the defendant before the operation, and, finally, that the extended operation was necessary for the health and in the opinion of the defendant reasonably necessary to preserve the plaintiff's life. In these circumstances was the defendant surgeon responsible for the consequences of the extended operation or was he justified in performing it? "It seems to me," said the Court, "that that justification must be found either in an assent implied by the circumstances which arose or in some other principle—broader than and outside of any consent—founded on philanthropic or humanitarian considerations."

Quoting an American case,† the Court laid it down as a general principle of law that "ordinarily, where the patient is in full possession of all his mental faculties and in such physical health as to be able to consult about his condition without the consultation being fraught with

* (1933) 3 D.L.R. 260.
† Pratt *vs.* Davis (1906), 244 Ill. 300 at p. 305.

dangerous consequences to the patient's health, and when no emergency exists making it impracticable to confer with him, it is manifest that his consent should be a prerequisite to a surgical operation''. In other words under a free government the first right of a citizen is the right to the inviolability of his person, and the necessary consequence of this right is that a surgeon who has been asked to examine, diagnose, advise, and prescribe for his patient cannot without the patient's permission violate his bodily integrity by a major or capital operation, placing him under an anæsthetic for that purpose, and operating upon him without his consent or knowledge. It is the right of every one to determine what shall be done with his own body.

Practical considerations, however, require that this rule should not be applied too strictly. If a person should be injured and rendered unconscious, and his injuries are of such a nature as to require prompt surgical attention, a medical man would be justified in applying such medical or surgical treatment as might reasonably be necessary for the preservation of his life or limb, without his express consent. Again, if in the course of an operation to which the patient had consented, the medical man should discover conditions not anticipated before the operation was commenced, and which, if not removed, would endanger the life or health of the patient, he would be justified in extending the operation to remove or overcome them, though no express consent to the extension could be given in the nature of things. In such an emergency the surgeon would not be responsible unless the patient had expressly forbidden any extension of the operation.

The juridical basis for holding the surgeon blameless in such cases is sometimes said to be the implied consent that the patient is presumed to have given, sometimes that the operating surgeon is the representative of the patient to give consent. To this the Court said, with much reason, ''I am unable to see the force of the opinion, that in cases of emergency, where the patient agrees to a particular operation, and in the prosecution of the operation, a condition is found calling in the patient's interest for a different operation, the patient is said to have made the surgeon his representative to give consent. There is unreality about that view. The idea of appointing such a representative, the necessity for it, the existence of a condition calling for a different operation, are entirely absent from the minds of both patient and surgeon. The will of the patient is not exercised on the point. There is, in reality, no such appointment. I think it is better, instead of resorting to a fiction, to put consent altogether out of the case, where a great emergency which could not be anticipated arises, and to rule that it is the surgeon's duty to act in order to save the life or preserve the health of the patient, and that in the honest execution of that duty he should not be exposed to legal liability.''

The further point was raised by the defendant that the plaintiff's action was barred by the Statute of Limitations, which lays down that actions for assault and battery must be commenced ''within one year after the cause of such action arises''. To this the plaintiff replied that the action was one for negligence and malpractice, and, as such, could be taken anytime within a period of three years under the Nova Scotia Medical Act. The Court held that the present action was one for assault and battery, and, as such, was barred as having been taken outside the yearly period. ''The distinction ordinarily between an unauthorized operation amounting to assault and battery on the one hand, and negligence such as would constitute malpractice, on the other, is that the former is intentional, while the latter is unintentional.''*

The Court came to the conclusion that the defendant, after he had commenced the operation, discovered conditions that neither he nor the patient had anticipated and which could not have been reasonably foreseen, and that in extending the operation the defendant acted in the interest of his patient and for the protection of his health and possibly his life. ''The removal I find was in that sense necessary, and it would be unreasonable to postpone the removal to a later date''. For this reason, as well as on the ground that the action was barred under the Statute of Limitations, the action was dismissed.

G.V.V.N.

* Hershey *vs.* Peake (1924), 115 Kan. 562.

Abstracts from Current Literature

Medicine

Septicæmia. Kolmer, J. A., *Ann. Int. Med.*, 1934, 8: 612.

Early bacteriological examination of the primary focus of infection is important. Septicæmia may be first detected by a positive blood culture; the absence of classical symptoms and signs by no means excludes a blood stream infection. Whenever possible, the blood for culture should be taken from a vein draining the infected area. Leucocyte counts should be made at frequent interavls. An increase in the immature polymorphonuclears, designated by Schilling as a ''shift to the left'', may occur with but slight and insignificant increase in the total count, yet affords valuable information as to the severity and progress of the infection. Adequate surgical drainage of foci of infection in the fixed tissues is of fundamental importance in treatment. In hæmolytic streptococcus infec-

tions the author still believes in the early use of anti-streptococcus serum. In staphylococcus septicæmia and in pneumococcus infections, meningococcus, gonococcus and anthrax septicæmias, the prompt and free administration of the respective immune sera should be resorted to at the earliest possible moment. Blood transfusions are usually helpful, supplying not only fresh leucocytes for the elaboration of bacteriocidal substances, but also complement. Frequent small transfusions appear more helpful than occasional large ones.

The author discusses various methods of immuno-transfusion. He is more impressed with the probable value of non-specific than of specific immunization of the donor. This may be done by giving the donor 50 to 75 million dead typhoid bacilli intravenously three to seven hours before the transfusion. The use of staphylococcus bacteriophage is recommended in doses of 5 c.c. subcutaneously, once daily, or of 1 to 2 c.c. intravenously, once or twice daily. Non-specific protein reactions are often of very great value if used early, while the bone marrow and the reticulo-endothelial system have the capacity for favourable reaction. Other measures of great importance in treatment are the exhibition of large amounts of fluid and of vitamin A. The author recommends the prophylactic use of antistreptococcus serum as a routine in all cases of abnormal labour or abortion, as well as after mastoid operations, and in all cases of wounds inflicted by dirty instruments.

H. GODFREY BIRD

The Plasma Proteins and Cardiac Œdema. Thomson, W. A. R., *Quart. J. Med.*, 1934, **3**: 587.

The author has investigated the plasma proteins in 54 patients, 18 with cardiac œdema. He finds a definite diminution of total proteins in the latter cases, a diminution which is selective, since the globulin and fibrinogen content is unaffected, the albumin fraction alone being lowered. Eighty-seven and one-half per cent of the cardiac œdema cases had a plasma albumin of less than 3.2 g. per cent (normal 4.6 g.). Other work on the subject is fully reviewed and discussed. The osmotic pressure of the plasma varies directly with the albumin content (the globulin-fibrinogen fraction has a lesser influence on it). The author has made no direct estimates of the osmotic pressure in his cases, being content to calculate it from Govaert's generally accepted figures. By this method, the cardiac cases with œdema were shown to have an average osmotic pressure of 23.52 cm. water (average normal, 39.8 cm.). The chief factor tending to drive fluid from the blood stream into the tissues is the intracapillary hydrostatic pressure; this is balanced by the osmotic pressure, which tends to draw fluid from the tissues into the blood stream. A balance must be maintained between these two forces or œdema results. In nephrotic œdema the balance is upset solely by a great drop in osmotic pressure, the capillary pressure remaining about normal. In cardiac cases with œdema there is good reason to believe that there is considerable rise in intracapillary pressure as well as the demonstrated fall in osmotic pressure. In both conditions we have a preponderance of hydrostatic over osmotic pressure—hence œdema. The most important cause of the diminution in plasma albumin noted is felt to be malnutrition, due largely to the anorexia, nausea, and vomiting resulting from chronic congestion of the liver. It may be that defective liver function may grossly interfere with protein regeneration in this organ.

From the above considerations the author feels that it is a mistake to markedly restrict the protein intake in cardiac cases, as has been the rule in the past. The necessity for salt and fluid restriction is recognized, but he advises that the diet be as high in protein as is consistent with the patient's digestive powers. No evidence is offered of the efficacy of such diets in cardiac cases, but the suggestion would appear to be well-founded.

W. FORD CONNELL

The Correlation of Initial Deflections of Ventricular Complex with Situation of Acute Myocardial Infarction. Barnes, A. R., *Am. Heart J.*, 1934, **9**: 728.

This article presents the data from 20 cases in which myocardial infarction occurred and in which electrocardiograms conformed more or less closely to the Q_1 or Q_3 type, as described by Wilson and his associates. In 7 cases in which the electrocardiograms were typical Q_1 types, infarction was found in each instance in the anterior portion of the left ventricle and the adjacent septum. There were also associated in each case changes conforming to the T_1 type. In 15 cases in which a Q_3 type of electrocardiograms was found, infarction occurred in the posterior basal portion of the left ventricle. In each case T_3 type of change was also present. As stated, it does not necessarily follow that acute infarction in these areas will lead to the development of Q_1 T_1 or Q_3 T_3 types of tracings. Low voltage of the initial deflection, bundle branch block, multiple acute infarcts, acute pericarditis, etc., may obscure or prevent the recognition of either the Q or T patterns. Also the electrocardiographic picture of acute myocardial infarction may be lost if the electrocardiograms are not taken in sufficient number or in proper time relation to acute coronary occlusion.

W. H. HATFIELD

Surgery

Appendicitis and Acute Inflammatory Abdominal Conditions in Scarlet Fever. Brandman, H., *Arch. Surg.*, 1934, **29**: 612.

The author reviews a series of 9 case records of patients who developed acute appendicitis or other acute inflammatory abdominal lesions in the Durand Hospital of the John Y. McCormick Institute for Infectious Diseases, Chicago. Such abdominal conditions, usually of the right lower abdominal quadrant, have been observed in mumps, whooping-cough, chicken-pox, smallpox, typhus, in anginal disorders, in disease of the respiratory tract and lungs, and in influenza and rheumatic fever.

There has been much controversy as to whether the acute appendicitis is an hæmatogenous metastatic product of which the hæmolytic streptococcus, among others, is the cause and the pharynx the source of dissemination. The whole lymphoid apparatus is involved in the onset and course of scarlet fever. The same reactions as are seen in the neck, groin, and elsewhere may exist in the appendix and other abdominal aggregates of lymphoid tissue so that the condition may occur in one of two ways: (1) as a part of the general reaction of the lymphoid apparatus at the onset and figuring in the production of abdominal symptoms of the prodrome of scarlet fever; (2) as one of several lymphoid aggregates that may go on to an acute abdominal lymphadenitis in the appendix, ileocæcal mesentery and ileum and elsewhere. The pathogenesis is not known, but the theory of infection through the blood stream spread and from the throat is plausible. The treatment is the same as for acute appendicitis in general.

G. E. LEARMONTH

Gas Bacillus Infection Complicating Laparotomy. Nason, L. H. and Starr, A., *Arch. Surg.*, 1934, **29**: 546.

Following a laparotomy gas-bacillus infection may develop and pursue a clinical course which may terminate fatally with startling rapidity. The surgeon may be mystified as to the cause of death, unless careful bacteriological studies have been made. The majority of infections with the gas-bacillus have occurred after appendicectomy for gangrenous appendicitis. The presence of streptococci, staphylococci and *B. coli* results in an increased virulence of *B. welchii*. The infection may begin in the muscles of the abdominal wall, the peritoneal cavity, or the liver. The clinical picture is one of overwhelming toxæmia. Certain alarming signs may develop in from six to twelve hours after operation. There is a slow steady drop in blood pressure and the pulse rate is accelerated. The skin and extremities are pale, cold and moist. The patient becomes stuporous and finally lapses into coma. There is a progressive increase in body temperature, reaching some times as high as 108 to 110° F. Complete anuria may occur. There is a possibility that some of the so-called post-operative "liver deaths", may be due to gas bacillus infection. Early recognition of the disease is imperative if any result is to be expected from treatment. Large doses of gas bacillus antitoxin should be given intravenously. From one to four therapeutic doses of polyvalent antitoxin, containing at least ten thousand units each of *B. welchii* and *Vibrion septique* antitoxin per dose should serve as the initial administration. The intravenous administration of antitoxin should be repeated every two to four hours during the crucial period. With crepitation in the wound free incisions may be necessary. The outlook is almost hopeless if the infection involves the blood stream, peritoneum, or liver. Death occurred in all of the four cases reported by the authors.

G. E. LEARMONTH

The "Push-Back" Operation in Cleft-Palate Surgery. Dorrance, G. M., *Ann. Surg.*, 1935, **101**: 445.

The primary purpose of any cleft-palate operation is to repair the split palate and to correct the speech defect. Satisfactory speech will result if the nasopharynx can be shut off from the oropharynx. Such a closure is impossible in many cleft-palate patients because of a short palate. In normal persons the elevator muscles of the pharynx pull the relaxed muscles upward and forward, while the lateral walls approach the mid line. The velum is brought upward and backward by contraction of the levator palati muscles. The pterygopharyngeal portion of the superior constrictor muscle produces sphincteric closure of the nasopharynx. In cleft palate the anterior segment of the muscle forming the pharyngeal ring is split and the separated ends are far apart.

The "push-back operation" is done in two or more stages. At the 1st stage the relaxation incision is made and the posterior palatine vessels and nerves are divided. The flap is then sewn back into position. Three or more months later the flap is again raised. The palatal aponeurosis and nasal mucous membrane are freed from the hard palate. The hamular process is divided on each side. When tension is freed the two halves of the cleft palate meet easily in the mid-line and the velum will be in contact with the pharyngeal wall. The edges of the cleft are denuded. After the nasal side sutures are inserted an antitension intra-muscular aluminium-bronze suture is used to approximate the separated ends of the superior constrictor. The oral mucous membrane is then sewn. The anterior end of the retroposed flap is held in place with a suture through bone, plus a pad held in place by a silver wire passed about the teeth.

The "push-back operation" should be used in cases with congenital shortening of the palate, cleft velum, and cleft palate which extends as far forward as the junction of the anterior third with the middle third of the hard palate. The operation should not be done on a patient under five years of age.

STUART GORDON

Obstetrics and Gynæcology

A Roentgenological Study of the Mechanism of Engagement of the Fetal Head. Caldwell, E. R., Moloy, H. C. and D'Esopo, D. A., *Am. J. Obst. & Gyn.*, 1934, **28**: 824.

The roentgen ray, interpreted by the precision stereoscope, offers a distinct refinement in obstetric diagnosis during labour. This method is rapid, accurate and practical. All examples of atypical labour warrant a roentgenological examination, with immediate interpretation of the films, before resorting to operative interference. Positions at the inlet may be divided into three classes: (a) primary posterior positions; (b) primary transverse positions; and (c) primary anterior positions, including the direct occipito-anterior. The transverse parietal position represents the common position at the onset of labour. The act of engagement of the fetal head is the reverse of the principle known as synclitism, hitherto accepted as the common method of engagement. Posterior rotation is assisted by the angle assumed by the fetal axis along the slope of the uterine wall toward the inclined inlet. The uterine contractions impart a spiral movement of the body along these two inclined planes, and rotation forward along the line of least resistance. The attitude of the fetus at rest and the changes secondary to the onset of labour have been described.

ROSS MITCHELL

Blood Chemistry in Pre-Eclampsia and Eclampsia. Stander, H. J. and Cadden, J. F., *Am. J. Obst. & Gyn.*, 1934, **28**: 856.

Pre-eclampsia and eclampsia are regarded as the same disease. Frequently repeated blood chemical studies in 108 eclamptic and 40 pre-eclamptic patients reported in this paper show that the blood chemistry is an indispensable index of the severity of the disease and the specific treatment needed. The non-protein nitrogen content of the blood in eclampsia and pre-eclampsia remains within normal limits except in certain instances, late in the process, when a rise indicates involvement of the kidneys as a result of the eclamptic disease.

The blood urea nitrogen remains low, as in normal pregnancy, with the result that the ratio between urea nitrogen and non-protein nitrogen is about 0.4 as compared with 0.5 in normal non-pregnant women. The blood uric acid is increased in eclampsia and pre-eclampsia, indicating a disturbance in its destruction in the liver. The uric acid content in the blood may be regarded as a fairly safe criterion of the severity of the disease. The blood sugar in eclampsia and pre-eclampsia is not greatly disturbed. Occasionally a definite hyperglycæmia follows an eclamptic convulsion, due perhaps to muscular activity. The alkali reserve is often greatly decreased in this disease, sometimes even to the level of true acidosis. The CO_2-combining power is our best and most readily available index of the necessity of anti-acidosis treatment. The blood chlorides are not markedly decreased, except in an occasional patient with marked œdema. Blood thioneine values in eclamptic patients are within normal limits. Glutathione is similarly within normal limits, except in patients with low hæmoglobin readings. The increase in blood uric acid in eclampsia and pre-eclampsia cannot be accounted for by an increase in thioneine. The hyperglycæmia sometimes observed in the convulsive stage of eclampsia appears to be a true hyperglycæmia and is not due to glutathione or thioneine.

ROSS MITCHELL

Primary Carcinoma of the Fallopian Tubes. Kahn, M. E. and Norris, S., *Am. J. Obst. & Gyn.*, 1934, **28**: 393.

Since Orthmann's description of primary carcinoma of the Fallopian tubes in 1881 additional reports have brought the total cases to 270. Four additional cases, including the two youngest on record, are reported. The significance of inflammation as an etiological factor seems disputed. Three of the four patients showed evidence of chronic inflammation. A clinical diagnosis is extremely difficult. Hope for increasing these diagnoses lies in keeping the possibility constantly in mind. At operation the lesion many times simulates chronic tubal inflammation or tuberculosis, from which conditions it must be differentiated. Opening of all tubes at the operating table and their inspection for papillary growths, as advised by Gupta, would at times aid in the diagnosis and in the institution of the proper surgical treatment. A negative curettage, with a history of irregular bleeding or a brownish or bloody discharge in a woman beyond forty, is suggestive of tubal carcinoma. In such cases the adnexa should be carefully palpated for enlargements.

ROSS MITCHELL

Pædiatrics

Sporadic Cretinism in One of Twins. Dorff, G. B., *Am. J. Dis. Child.*, 1934, **48**: 1316.

A male child, twin to a normal female, exhibited cretinism which had been more or less apparent from birth. Skiagrams of his bones

showed that the condition was in truth congenital, many of the ossification centres which should have been present before birth having failed to develop, even at 17 months. Dorff discusses the etiology of the condition, and concludes that it is not due to an infection of the fetal thyroid but to a developmental inadequacy of the tissue. This inadequacy cannot be compensated for by secretion from the maternal thyroid, since there is no proof that the placenta is permeable to the complex combination of iodine and thyroxine. The fact that the other twin was normal precludes the explanation that it was any lack in the maternal thyroid or diet that led to the condition. He also reports another instance of cretinism in twins, the female being affected, the male normal in this case. He cites three authors as having described cretinism in twins; Hermann's being one of male twins affected; Manson's, both of male twins affected; and Petschacher's, both twins, sex not stated, affected. Dorff feels that this case of his proves two things, (1) that the defect is present before birth, (2) that it is dependent upon factors inherent in the fetus, not in the environment.

MADGE THURLOW MACKLIN

Galactosuria. Park, E. A., *Am. J. Dis. Child.*, 1934, **48**: 1438.

Disturbances of metabolism, such as diabetes mellitus, cystinuria, pentosuria, etc., are known to be hereditary. A new disturbance of metabolism that proves to have a constitutional basis has been described, namely galactosuria, and Park has described it in a brother and sister, both of whom died with the condition before it was completely recognized. The patient shows a normal tolerance for dextrose and fructose, but has a decreased tolerance for lactose and galactose. The dextrose in the blood is normal when the infant is on a milk-free diet, but becomes depressed when milk is added to the diet. After the administration of epinephrine, the dextrose level in the blood is raised normally, both when the infant is on a milk-free diet and when it is getting milk, but the galactose level remains unaltered after the exhibition of the adrenalin. The liver is very much enlarged, due to the abnormal storage of glycogen in its cells. The presence of this rare metabolic anomaly in two siblings bespeaks its hereditary nature.

MADGE THURLOW MACKLIN

Infant Feeding and Nutrition. Friedman, S., *Am. J. Dis. Child.*, 1935, **49**: 153.

This article presents a useful summary of the development of infant feeding during past years. The subject is discussed under four headings: breast milk and feeding of the newborn; artificial feeding; mineral metabolism; and vitamins.

As a general proposition, most will agree that breast milk is the incomparable food for human infants. This accounts for the fact that numerous plans have been adopted to adjust cow's milk to the human standard. The observations of Huenekens and of McKay go to show that artificially-fed babies have a mortality rate from three to four or five times greater than that of breast-fed. To modify this conclusion, it may be noted that some authorities have found that, while before the sixth month the breast-fed infant makes a better gain in weight than the artificially-fed one, the latter gains more proportionately after this time. Also, according to Hoefer and Hardy, basing their conclusions on a study of 383 children ranging from 7 to 13 years, artificially-fed children are, on the whole, mentally and physically inferior to the breast-fed.

Attempts have been made to increase the antirachitic factor in human milk by dieting the mother and administering to her cod liver oil and concentrates of vitamin D, and also by irradiating her with ultra-violet light. Some benefit seems to be derived from these measures.

Conclusions as to the value of acidified milk are to be drawn with hesitancy and difficulty. Routine feeding with acidified milk would seem to be superfluous. In regard to protein milk Finkelstein concludes that cow's milk whey has an influence in producing digestive upsets in infants.

Evaporated, condensed, and dried milks have gained in popularity. Apparently, heating alters the casein and makes it more digestible. Evaporation does not destroy vitamins A and D, though it does destroy one-fifth of the vitamin B_1. Reports as to the value of dried milk are almost uniformly favourable. Banana flour as a source of carbohydrates is increasingly popular. Milk prepared from the soy bean, fortified by the addition of 4.5 per cent of dicalcium phosphate and 1.3 per cent of sodium chloride is also popular just now.

There is some evidence to show that certified milk has a superiority over the ordinary pasteurized milk, doubtless owing to its better quality.

JOHN NICHOLLS

Therapeutics

Hæmoptysis—A Note on Pathology and Treatment. Morlock, H. V. and Scott-Pinchin, A. J., *Brit. M. J.*, 1934, **2**: 762.

Hæmorrhage from the lungs or stomach is not accessible to ordinary surgical methods of hæmostasis. The generally accepted modes of treatment have two objects, first, to promote clotting at the site of hæmorrhage by the administration of such drugs and sera as may increase the coagulability of the blood, and, secondly, to endeavour to secure rest for the bleeding organ

and quiet the mind and body of the patient by the use of sedatives. In the first group, we have calcium, hæmostatic serum, etc., routinely used but unreliable in their action. Consequently, more reliance is usually placed on sedative measures. A successful use of such therapy results in slow arrest of the bleeding, any movement or disturbance of the patient causing it to recommence. Usually, then, there is considerable blood in the lumen of the concerned organ. With gastric or intestinal bleeding this blood escapes via the intestinal tract, but in hæmoptysis the blood remains in the bronchus and must be evacuated by cough. Often the patient has been so morphinized, however, that the cough reflex is lost; in such a case, the dangers are considerable. There is danger of aspiration of the blood into the smaller bronchi and bronchioles. Or a weak cough may expel the blood only to the tracheal bifurcation, from whence it is aspirated into the healthy lung. In tuberculous hæmorrhage organisms may thus be aspirated with the blood and spread the disease. If a large bronchus is obstructed by clot collapse of a lobe may occur. Even a sound lung may thus be collapsed. All these dangers are illustrated by case reports. It is pointed out that in acute septic pneumonitis, in lung abscess, or in hæmorrhagic bronchiectasis, there is seldom hæmoptysis severe enough to endanger life; hence, it is not justifiable to use a method of treatment which may spread disease. Hence, the authors advise strongly against treatment calculated to dull or abolish the cough reflex, although small doses of sedative are necessary to quiet and reassure the patient. In advanced tuberculosis or malignant disease there is of course no contraindication to the extensive use of morphine.

Having decided against extensive sedation, the authors have looked for a reliable hæmostatic and believe they have such an agent in Congo Red. They advise an intravenous dose of 10 c.c. of a 1 per cent solution for an adult, no more. Smaller doses do not stop the hæmorrhage; larger doses give alarming reactions. The Congo Red appears to act by increasing the blood fibrin content and reducing the clotting time (also increases the monocytes and blood platelets). The writers have used the drug in many cases and report only two failures. It may be necessary to repeat the dose in 4 to 6 hours. Congo Red hæmostasis is noted as being fairly satisfactory in gastric and duodenal hæmorrhage also, although not so good as for hæmoptysis.

W. FORD CONNELL

The Surgical Treatment of Essential Hypertension. Page, I. H. and Heuer, G. J., *J. Clin. Investig.*, 1935, **14**: 22.

Adson and Brown, in 1934, were the first to attempt the surgical treatment of hypertension by section of the sympathetic nerve supply to the splanchnic region. They hoped in this way to remove the sympathetic innervation of sufficient arteries to modify arterial responses, to denervate thoroughly the adrenals, and to remove the effects of intra-abdominal tension. Anatomical considerations suggest that this can be done best by section of the anterior roots from the sixth thoracic to the second lumbar nerve. The work of Adson and Brown did not show so great a drop in blood pressure as they had hoped, because there had been structural changes in the blood vessels.

Page and Heuer thought it desirable to try the treatment in a case in which the vascular tree was still flexible, so far as could be determined by anatomical and physiological evidence. They found that the level of the blood pressure fell quickly to normal and remained so. The kidneys, though they were denervated by the operation, still retained their efficiency. There was no decrease in their ability to excrete urea and no increase in the number of the red cells in the urine. There was a slight loss in their power to concentrate the urine. Though there was a fall in blood pressure there were no untoward subjective symptoms. The patient's headaches, palpitation and precordial pain disappeared. The findings from the blood chemistry gave no indication of renal insufficiency.

JOHN NICHOLLS

The Effect of Renal Denervation on the Level of Arterial Blood Pressure and Renal Function in Essential Hypertension. Page, I. H. and Heuer, G. J., *J. Clin. Investig.*, 1935, **14**: 27.

Hypertension is one of the most frequent complications of renal disease, both acute and chronic. The fact that in nephritis renal influences, nervous or other, apparently cause hypertension suggests the possibility that the cause of essential hypertension may lie in nervous influences from the kidneys, even though these organs themselves appear to be entirely normal at the onset of the hypertension. Accordingly, bilateral renal denervation was performed on a patient with essential hypertension uncomplicated by detectable renal involvement, and with but slight incidence of anatomical changes in the circulatory system. They found that the arterial blood pressure level was unchanged by the operation. Renal efficiency was unaffected; it was normal before the operation and remained so afterwards. Hence, they believe that essential hypertension does not originate, in whole or in part, in derangement of the nervous mechanism of the kidneys.

JOHN NICHOLLS

Oto-Rhino-Laryngology

The Otosclerosis Problem: Including Reports of Two Cases Examined Pathologically. Gray, A. A., *J. Laryngol. & Otol.*, 1934, **49**: 629.

At the present time none of the theories regarding the etiology of otosclerosis explain fully both the clinical findings and the pathological changes.

The clinical features are as follows. First, there is deafness of a slow but progressive type, with loss of ability to hear the low notes of the scale. Secondly, there is tinnitus, which may be severe or slight, but which is never absent altogether. The so-called paracusis Willisii, that is, the ability to hear better in a noisy place than in a quiet one, may or may not be present. When it does occur it is very characteristic. Similarly the rosy tint of the posterior half of the tympanic membrane is only present in about 50 per cent of the cases. An almost invariable sign is the very sluggish vasomotor response of the blood-vessels of the tympanic membrane. The sensitiveness of the membrane is usually diminished. There is of course much greater loss of hearing by air conduction than by bone conduction.

The pathological changes, which have been frequently described, bear very little relationship to the duration of the disease, the severity of the deafness, or the degree of the tinnitus.

All these findings may be explained by the following theory. The essential cause of otosclerosis is a gradually increasing defect in the vasomotor mechanism which governs the nutrition of the structures of the organ of hearing as a whole. The axon reflexes are, of course, included in this vasomotor mechanism, and the stimulus which excites the vasomotor mechanism is sound and sound alone. Consequently the vestibular apparatus and the semicircular canals are unaffected in otosclerosis. The ordinary blood supply to the organ of hearing is adequate for nutrition but insufficient for function. In the normal organ of hearing the sound wave excites an increase in the flow of blood through the organ, enabling it to function properly. In otosclerosis the neurones conducting the necessary impulses fail to function properly, having developed a loss of irritability. The vasomotor reflex thus fails and the cells of the organ, while remaining normal in appearance or undergoing some degeneration, fail to function. It has been shown experimentally that stagnation of the blood in the bony canals of the labyrinth will produce bony changes such as occur in otosclerosis. The deafness of otosclerosis is to a large extent functional, and is the result of the insufficient supply of blood to all the nerve structures concerned in the perception of sound.

The symmetrical distribution is readily explained by the fact that the vasomotor nerves of the organ of hearing are anatomically symmetrical. If therefore structural changes occur as a result of defective functioning of those nerves, such structural changes will naturally be bilateral.

GUY H. FISK

Anæsthesia

Spinal Anæsthesia. Sebrechts, B., *Brit. J. Anæsthesia*, 1934, **12**: 4.

The author emphasizes that in all operations the anæsthetic agent must be chosen with due regard to the condition of the patient and the nature of operation to be performed. He points out that there are two classes of patients; those who are "rachi-sensitive" with whom the normal dose is excessive and dangerous, and also those who are "rachi-resistant", with whom the normal dose is partially or completely ineffectual. He was able to establish this fact as a result of spinal anæsthesia administered to five members of one family, all of whom proved "rachi-resistant". These two classes of patients represent a characteristic that is familial in nature.

A new technique for the administration of percaine is advocated. It consists in leaving the spinal puncture needle *in situ* after the puncture has been made and making repeated injections of 5 c.c. of percaine (1:1,500) at 5 minute intervals, until a sufficiently high anæsthesia has been established. The author contends that the sudden withdrawal of appreciable volumes of cerebrospinal fluid to mix with the anæsthetic agent before re-injection, especially when done with the patient sitting up, causes the brain stem to be forced down into the foramen magnum. This explains the headache following diagnostic lumbar puncture. In addition to this, however, the injection of a foreign substance, as is practised in the course of spinal anæsthesia, constitutes another causative factor in cephalalgia. The injection of appreciable amounts of percaine, without withdrawal of spinal fluid, actually causes the pressure of the spinal fluid to diminish more or less instantly. This fall of pressure is no doubt due to the modification of the blood circulation within the epidural spaces. As the pressure falls the choroid plexuses reflexly secrete an increased quantity of liquid to compensate for the fall of the pressure. The medulla oblongata, which is stopping up the occipital foramen, prevents the liquid from penetrating from the cranium into the perimedullar space and thus increases the intracranial tension. Further, the hypotension of the blood in spinal anæsthesia, which is a more or less constant factor and is also manifested within the cerebral circulation, may be followed, especially in subjects with vascular hypertonia, by a reaction which expresses itself in intracranial hypertension with subsequent cephalalgia, or even manifestations of cerebral congestion. Hence the importance of preventing the excessive drop

in blood pressure by minimal anæsthesia and by the administration of ephedrine beforehand is obvious.

ARTHUR WILKINSON

Radiology and Physiotherapy

Roentgen Therapy in Syringomyelia. O'Brien, F. W., *Radiology*, 1935, **24**: 16.

X-ray has been used in this condition by a number of radiologists since 1924; good results have been reported in from 50 to 75 per cent of all cases treated. The improvement has been noted with several techniques, varying from moderate to intensive dosages; with higher voltages Dr. O'Brien believes that the improvement is more immediate. How x-irradiation acts to relieve symptoms in syringomyelia is problematical. Age is not so important in prognosis as the character of the pathological changes present which produce syringomyelia. The same rule is true when considering the duration of the disease. The whole cord and medulla are treated, with special emphasis on the area localized by the neurologist. It is admitted that this disease without treatment may show remission, but improvement follows treatment in so many cases, and so promptly, that x-irradiation may be conservatively pronounced the method of choice in syringomyelia, because in 25 years' observation no other method of treatment shows such a high percentage of favourable results.

A. S. KIRKLAND

Pigmented Moles and their Treatment. Anderson, H. F. and Simpson, C. A., *Am. J. Roentgenol.*, 1935, **33**: 54.

The structure of these usually benign lesions is discussed and the literature reviewed. When they become malignant we have a melano-sarcoma, or we may get an epithelioma, either basal- or prickle-celled, arising from a mole either pigmented or non-pigmented. These moles should be removed, especially if they show any sudden change in size or increase in pigmentation (frequently the result of irritation from trauma or infection). The danger of removal to the patient is in a ratio of about 1 to 1,500.

Three methods of removal are suggested: (1) complete surgical removal with a cold knife, including a good half inch of healthy tissue on every side and beneath. Incision for biopsy or incomplete excision is hopelessly bad technique. (2) Hyper-massive soft unfiltered x-ray radiation, producing a slough; all given in one dose. (3) Thorough dessication, followed by curetting, and, finally, a light dessication of the entire area. Any of these methods should be followed by frequent examination.

The prognosis with melano-malignancy is bad, but not so bad as 15 years ago. In the simple mole any of the three methods is adequate. All the condemnation in the literature is wrong and unfair. In melano-malignancy hyper-massive doses of x-ray are undoubtedly superior to past methods of procedure.

A. S. KIRKLAND

Pathology and Experimental Medicine

Chronic Congestive Splenomegaly and its Relationship to Banti's Disease. Larrabee, R. C., *Am. J. M. Sc.*, 1934, **188**: 745.

The author has analyzed 47 cases of splenomegaly from the records of the Boston City Hospital, in an attempt to discover the cause of the enlarged spleen. Clinically, all had large spleens. Gastro-intestinal hæmorrhages occurred in 25. Ascites was present in 25. The blood showed more or less anæmia in 44. This anæmia was almost invariably of the "secondary" or microcytic type. Leucopenia occurred in 38 cases. A leucocytosis commonly indicated some complication. The platelets were reduced numerically in 23 of 42 cases. Thirty-one of the spleens were examined histologically by Mallory and his assistants. Fibrosis was invariably present, though in varying degrees. Usually there was more or less vascular congestion. On the whole the changes were such as might be fully accounted for by long-continued passive congestions. The cause of the splenomegaly was congestion from alcoholic cirrhosis of the liver in 9 cases; toxic cirrhosis in 3; syphilitic cirrhosis in 5; cirrhosis of undetermined type in 7; non-cirrhotic liver abnormalities in 2; adhesions in 5; congenital heart disease in 1; ptosis of the spleen in 1; and unknown in 14. While admitting that these cases cannot properly be classified as Banti's disease, yet the author stresses the point that they are the result of mechanical obstruction to the blood flow from the organ, whether from ptosis of the organ, lesions in the liver or portal vein, or, as in Banti's disease, from phlebitic and sclerotic changes in the splenic vein. They have the same clinical picture and exactly the same splenic abnormalities. He is forced to the conclusion that most, if not all, cases of splenomegaly of this type are not only associated with lesions interfering with the outflow of blood from the spleen but actually are the result of such lesions. Further, he found all about equally susceptible of improvement after splenectomy. Although unwilling to discard entirely the group of cases clinically known as Banti's disease, yet he believes that the majority of these are dependent upon various intra-abdominal lesions obstructing the venous outflow of the spleen, and should be treated by splenectomy, regardless of the nature of the underlying lesion.

E. S. MILLS

Obituaries

Dr. Spurgeon Campbell. The sudden death of Dr. Spurgeon Campbell at his home on February 10th brought sorrow to the hearts of many, not only in Winnipeg where he had practised for nearly thirty years but throughout Canada—for he had a positive genius for friendship and made friends everywhere.

Born at Iona, Ont., on April 15, 1870, he was educated in public schools, Dutton High School, and began his medical course at Western University, London, but took his final year in Manitoba Medical College, graduating in 1904. A general practitioner of the best type, he acquired a large practice in Winnipeg which was interrupted by the world conflict. Prior to the onset of the war he had become an officer in the 16th Cavalry Field Ambulance, succeeding to the command in 1914. In 1915 he proceeded overseas with the 4th Field Ambulance and saw service in France. Returning to England in 1917, he became Medical Officer to the Fifth Division Artillery, but toward the end of that year again went to France to command No. 4 Canadian Casualty Clearing Station, succeeding the late Lt.-Col. S. W. Prowse. This unit, which had been raised by the Manitoba Medical College, saw much service during 1918, and Lt.-Col. Campbell was awarded the C.M.G. In June, 1918, his only son Kenneth, a pilot in the Royal Air Force, was shot down in aerial combat, and Col. Campbell, on hearing the news, commandeered an ambulance, rushed to the scene and rescued the body from the wrecked plane in No-man's Land. After the armistice, he was in charge of a demobilization camp at Le Havre.

On his return to Winnipeg, Dr. Campbell resumed practice, his great geniality and kindness of heart making him extraordinarily popular. He was president of the Winnipeg Medical Society, and for thirteen years served on the Honorary Attending Staff of the Winnipeg General Hospital.

Dr. Campbell's first wife and his two boys predeceased him, but he is survived by his second wife, née Ethel Ferguson, of Port Stanley; two brothers, Dr. Alex. Campbell, of Grand Rapids, Mich., who served in the American Expeditionary Force; and J. P. Campbell, of Spokane, Wash.; and three sisters, Mrs. Donald Hillet, Detroit, Mich.; Mrs. Duncan Patterson, Toronto, and Mrs. Phillpot, Denver, Col. After a funeral service in All Saints Church on February 11th the body was taken to St. Thomas for burial.

"Spurg" Campbell, as he delighted to be called, was not only the devoted practitioner but the warm-hearted friend, and those who were privileged to know him are the poorer for his passing. Had he chosen to write his epitaph, it might have been in the words of Abou ben Adhem, "Write me as one who loves his fellow men".

ROSS MITCHELL

IN MEMORIAM

The ideal of friendship and the honour of the medical profession have been hallowed by the death of Dr. Spurgeon Campbell.

During his life from early years, when his brothers were going through their course in medicine and he was still carrying on the homestead, after high school at Dutton, and during his years at Western University, he was the cheery diligent helper of others, always alert when work was the order of the day, forehanded in planning a frolic, and ready with the means and manner that ensured happy holidays. In 1902 he came to Winnipeg to complete his medical course. Again, in new surroundings, with stranger companions, Spurgeon Campbell was soon known for his readiness to play the game, with his teachers, his fellow students, and himself. However fresh and bright the sphere of his influence, no grass grew on the path he trod. Vacation was not a loafing time to him. If hard labour met expenses more quickly than a white-collar job, his dress was overalls and his instrument a spade.

For thirty years we have loved and been loved by him. He has been our friend and the doctor to our families, partner in our games, pet and patron to our children, host and guest at our parties, comrade, whether junior or senior, in our military life during peace and war. He gave his son's life for the country's honour, in aerial conflict, and walked into No-man's Land to carry back that son's body, that his own paternal honour and love might be upheld. Need we tell how such a man served his patients? He died February 10th in the early morning upon returning from a midnight call, answered in spite of fatigue after a period of strenuous work at a practice that comprised rich and poor, devoted to the man whom patients and colleagues looked upon as typical of the revered family physician. F.A.Y.

Dr. James Syme Wardlaw. On February 22nd, Waterloo County lost one of its best known citizens through the death of Dr. James Syme Wardlaw at his home in Galt, Ontario.

Doctor Wardlaw was born in Scotland in 1851, and came to Canada with his family in 1853, settling first at Plattsville, Oxford County, Ontario. His father, John Wardlaw, was a manufacturer of woollen goods, with factories at Plattsville and Weston, and afterwards in Galt. James Wardlaw received most of his secondary school education in the last mentioned town. He worked in his father's factory, receiving a good knowledge of the textile industry. Wishing to learn more about the machinery, he entered the plant of the Goldie & McCulloch Company, and thence went to India, where he spent five years installing machinery in newly-opened factories there. Desiring to study medicine he returned to Canada, and graduated from Trinity Medical School with the class of 1888, receiving the Silver Medal. He also held degrees from Queen's and Toronto universities. He then took post-graduate work in New York.

In 1889 Doctor Wardlaw settled in Galt and began practice with Dr. Head, and afterwards with Dr. Sylvester. He was Medical Officer of Health for several years, retiring when he found his practice would not permit the necessary time for his work. He took an active interest in organized medicine. He was a Past-president of the South Waterloo Medical Society, a life-member of the Ontario Medical Association and a member of the Canadian Medical Association. He took a keen interest in education, and was for twenty-six years a member of the Galt Collegiate Institute Board.

Doctor Wardlaw was twice married, first in 1891 to Doreta Lundy, a daughter of the late Dr. Lundy, of Galt; his second wife was Mary Helen Ritchie, of Beaverton. He is survived by one daughter, Mary, and two brothers, Henry, in California, and Thomas, in Toronto.

For many years, in fact up to three years ago, Dr. Wardlaw enjoyed a very large family practice. He was a very skilful surgeon, and in his earlier years did much surgery in the farm houses of the community. As a general consultant he was in demand

by his confrères for miles around. He was a friend of the young doctor, and at least five men in the community owe much of their success to his help and advice. He was very fond of golf and at the age of 70 won the "C" Flight Championship of Canada. He was a member of The-Hole-in-One Club. The Doctor was a raconteur without equal in this community. His stories have been told and re-told many times. It was the Wardlaw candid pungency of humour that will make them told and re-told for many years to come.

To the writer he was a true friend and many times has been of great assistance in solving his medical problems. He played the game honestly and fairly with us, and we shall miss him.

WARD WOOLNER

Dr. Edwin D'Arcy Ault, of Toronto, died on February 12th. He was born in Aultsville, Ont., in 1846, the eldest son of the late Samuel Ault, M.P., of Stormont County. He received his early education at Upper Canada College, graduated (M.D., C.M.) from McGill University in 1868. For several years he practised in Chicago and on returning to Canada settled at Aultsville and district, where he built up a reputation as a country doctor. He is survived by his widow, Mary S. MacIntosh, and a son, Percy E., of Weston.

Dr. James Becket, of Toronto, died on February 10, 1935, at his home. He was born in 1872, a son of the late Rev. John and Agnes Becket. He graduated from the University of Toronto (1894).

Dr. T. Innes Bowie, of Streetsville, Ont., died at his residence on February 7, 1935, after a lengthy illness. He was in his 75th year and had never fully recovered from a stroke he suffered three years ago, when he retired from his practice. Doctor Bowie was a graduate in medicine from Trinity University (1893), and had practised his profession in Streetsville for forty years. He had been a school teacher in his early years and was an ex-warden of Peel County.

Dr. Cyril H. Burger died on February 27th at the Winnipeg General Hospital after a long illness, at the age of 66 years. He was a graduate of Queen's University, and took post-graduate work in Edinburgh where he practised for a number of years. His early life was spent in Kingston, Jamaica. About thirty years ago he came to Winnipeg and was one of the pioneer radiologists. Retiring in disposition, he was much admired by those who knew him for his fine character.

Dr. Alexander Crichton, of Castleton, Ont., died at the Cobourg Hospital on February 2, 1935. He was born in 1862.

Dr. Roderick MacDonald died at St. Laurent, Manitoba, on February 19th at the age of 83. He graduated from McGill University in 1873, and came to Manitoba in 1877 to be physician to the penitentiary at Stony Mountain. After holding this position for nine years he engaged in private practice, but always in the more remote and unsettled areas.

Dr. John Sangster McCallum, of Smith's Falls, Ont., died at his home on February 13, 1935, in his 88th year.

Dr| McCallum was born in Stouffville, Ont., in 1847, and graduated as Gold Medalist in medicine and surgery from Victoria College, Toronto, in 1872, coming to Smith's Falls in 1877, where he had since resided.

Dr. McCallum had occupied practically every position of prominence in his district during his more than fifty years of residence in Smith's Falls, and had served as mayor, member of council, school board chairman and member, president of the Board of Trade, and in various other responsible positions.

Surviving are his widow; two daughters, Mrs. A. Davidson, Smith's Falls, and Mrs. J. M. Forbes, Montreal; and five sons, Frank, Smith's Falls; Dr. John, Victoria, B.C.; George, Robert and Allan, of Ottawa.

Dr. William Gordon McCormack, of Toronto, died at St. Michael's Hospital, Toronto, on February 16, 1935. Dr. McCormack was born in Toronto in 1885 and was a graduate of the University of Toronto (M.B., 1920). During the Great War he served in the Canadian Air Force and later as medical officer in the Royal Navy.

On the conclusion of hostilities he returned to Canada and completed his studies. He is survived by his wife, Eva Thornton McCormack; one child; a sister, Mrs. Mabel Wilson, Oakville; and two brothers, Dr. James L. McCormack and Roy C. McCormack, both of Toronto.

Dr. William Morrison, of Toronto, died suddenly on February 23, 1935, at his residence. Born at Georgetown, Halton County, he received his primary education in the public and high schools. He graduated in Arts from the University of Toronto in 1900 and in Medicine from Queen's in 1908. He is survived by his widow, Anna Fallon, and by two children, Mae and William.

Dr. John Julian Paul, Georgetown, Ont., died in Guelph, on February 20th, after a brief illness. Dr. Paul was born in Bond Head seventy-two years ago, moving to Toronto with his family at an early age. In Toronto he attended the Grammar School, and graduated from Trinity Medical College in 1885.

He first practised in Sebringville, near Stratford, moving to Sunderland in 1918 and Georgetown in 1928.

He is survived by his widow, Catherine Mary Keeler; four sons, J. K. Paul, Calgary, Dr. R. T. Paul, Georgetown, Robert and Dr. George S. Paul, Toronto; and one sister, Mrs. T. Clark, Winnipeg.

Dr. James Ritchie Robertson, only son of Mr. T. R. Robertson, of Halifax, passed away in Glace Bay Hospital on February 27th, after a short illness. He graduated from McGill in 1925. Before coming to Halifax in 1933, he had practised in Amherst, Nova Scotia. He had gone to Cape Breton recently to take charge of Dr. Paton's practice while the latter is attending the sessions of the Nova Scotia Legislature.

Dr. Alexander Vernon Webster, of Vancouver, died suddenly from a heart attack on February 14, 1935, aged fifty years. In company with his wife he had just returned to his home from the theatre when he was stricken.

Born at Marie, Prince Edward Island, Dr. Webster was educated at Prince of Wales College, Charlottetown, and McGill University. He came to Vancouver in 1912, immediately upon graduation. In the twenty-three years of his residence here he became one of the city's best known physicians.

Surviving are his wife and a daughter, Kathleen, attending the University of British Columbia; his mother, three sisters and three brothers in Prince Edward Island; a sister in the Peace River country; and a brother, Dr. Leith Webster, of Vancouver.

News Items

Alberta

Dr. J. S. McEachern, President of the Canadian Medical Association, and Dr. D. S. Macnab, President of the Alberta Medical Association, have made a tour of Lethbridge and Medicine Hat in the interests of the closer organization of their two associations and better cooperation. The meetings were well attended and those present intensely interested.

The President, Dr. D. S. Macnab, has appointed seven district committees, whose duty it is to see that local medical societies may be organized wherever possible, and, further, that arrangements be made wherever possible for district medical societies, the thought being that these should be co-terminous with the present boundaries of the council districts.

The Council of the College of Physicians and Surgeons, after putting the matter in the form of a questionnaire, has finally adopted a schedule of fees, which can be said to be the result of the best thought of the whole profession.

A special committee of the Alberta Medical Association is reviewing the forms of all Canada, on which physicians give particulars of the cause of the death of the patient. The idea is to get a form that will be easily interpreted by the Vital Statistics Branch, so that cases that now are improperly reported as maternal deaths will be collectively classified. Unnecessary blame is placed on the profession by those who read the present statistics.

Certain features of the Maritime Conventions Act are being made to apply to automobile accidents, whereby the people involved in an accident will each bear his share of the cost in repairing the damage, in proportion to his responsibility. The Government is being asked to create a fund, either by ear-marking part of the motor license fund, or by making the driver's license fee an annual one, so that the cost of hospitalization and medical care of indigents injured in motor accidents may be met.

G. E. LEARMONTH

British Columbia

A committee appointed by the Greater Vancouver Health League, consisting of Mr. Mainwaring, and Drs. Amyot, Hatfield, and McIntosh, interviewed the Hon. Dr. Weir, the Provincial Secretary, Dr. Young, Provincial Health Officer, Dr. Cassidy and Dr. Lamb, and other members and officials of the Provincial Government on February 8th on the tuberculosis situation in the Lower Mainland.

Dr. McIntosh, the chairman of the committee, who is Vancouver City Health Officer, reported to the last meeting of the Health League that the Government has in mind the need for a Sanatorium on the Lower Mainland, but on account of money shortage this consummation is impossible at present. An immediate addition of 25 beds to the hospital accommodation now provided is planned, and steps are to be taken to provide 100 to 150 more as soon as money will be voted by the Legislature. Any further addition by the Government to the present Tuberculosis Clinic is impossible at present, but assumption of a portion of the costs of maintenance of provisions made for the care of tuberculosis in Vancouver and suburbs is looked on very favourably. The Metropolitan Health Board was instructed to draw up a proposed bill, in order to anticipate if possible the Rockefeller Foundation's change of policy in the matter of grants to Union Health Boards. A provincial health insurance measure, bearing upon the handling of tuberculosis, is postponed on account of contemplated action at Ottawa.

At a public meeting held at Tofino on February 25th, which was largely attended by the residents of the district, it was decided to establish a small emergency hospital there, to take care of accidents and cases of sudden illness for that section of the west coast of Vancouver Island lying between Long Beach and Cape Cook. This district includes a number of important fishing and whaling ports, and a doctor has been stationed at Tofino for some time past.

It has been announced by the Premier of the Province that Health Insurance legislation will not be passed at the coming Parliamentary session. The subject will be discussed during the session, but provincial action will probably not be taken until the subject has been dealt with by the Federal Parliament.

D. E. H. CLEVELAND

Manitoba

At the sectional meeting of the American College of Surgeons, taking in North and South Dakota, Wisconsin and Manitoba, held at St. Paul on March 15th, 16th, and 17th, Dr. George F. Stephens, Superintendent of the Winnipeg General Hospital, presided at the Hospital Conference. Dr. George Fletcher, Professor of Oto-Laryngology, University of Manitoba, Faculty of Medicine, gave an address on "Asthma and its relation to nose and throat diseases".

Dr. O. Bjornson addressed the Manitoba Historical and Scientific Society on April 17th on "The voyage of immigrants from Iceland to Lake Winnipeg in 1876". Dr. Bjornson, though only six years of age at that time, has a vivid recollection of the events connected with the trip, and spoke of the small-pox epidemic which attacked the little community on the shores of Lake Winnipeg shortly after arriving.

ROSS MITCHELL

New Brunswick

During the last month New Brunswick has been visited by an old-fashioned epidemic of influenza. A great many people have been more or less ill, and there have been a few deaths. A considerable number of pneumonias have been reported, and school children seem to be especially afflicted. Some schools have been closed, and others that have remained open have reported as high as 50 per cent of their pupils absent at one time.

On February 13th a New Brunswick Branch of the Association of Officers of the Medical Services of Canada was organized at Saint John. The organization meeting took the form of a dinner at the Admiral Beatty Hotel. Lt.-Col. G. G. Corbet, District Medical Officer of Military District No. 7 gave a short historical address, and other addresses were made by Lt.-Col. G. B. Peat, V.D., Lt.-Col. R. A. Hughes, Lt.-Col. C. M. Pratt, Major A. S. Kirkland, and Captain Dinsmore. Lt. A. A. Gordon Corbet gave an interesting report of the annual meeting of the Association at Ottawa last fall. The following officers were elected: *Honorary President,* Col. the Hon. Dr. Murray MacLaren, Lieutenant-Governor of New Brunswick; *Honorary Vice-president,* Lt.-Col. G. G. Corbet; *President,* Lt.-Col. D. C. Malcolm; *Vice-president,* Captain Dinsmore, Bathurst; *Secretary-Treasurer,* Captain D. W. F. Porter.

In the 22nd annual report of the Jordan Memorial Sanitarium, the Superintendent, Dr. P. M. Knox, stated "That the increasing number of indigent tuberculosis cases during the last three or four years has in certain municipalities raised the question as to whether tuberculosis as a disease is on the increase. I do not believe that the morbidity rate of tuberculosis is increasing, but certainly indigence at least from the standpoint of the individual's ability to finance several months' treatment in hospital is on the increase. Hence today a far greater percentage of tuberculosis sufferers require assistance from their municipalities than was noted four or five years ago."

Dr. R. J. Collins, Superintendent, Saint John Tuberculosis Hospital, reports that Saint John County has had a decrease of 37 per cent in its tuberculosis death rate during the last five years in comparison with the previous five years.

Saint John Medical Society held its regular monthly meeting on February 26, 1935. Routine business occupied the early portion of the meeting, especially some further reports on the proper method of handling the medical care of indigents within the municipality.

Dr. A. B. Walter, the speaker of the evening, read an address on "Hypertension and its many relations to cardiovascular and renal disease". Dr. Walter gave a summary of the present-day literature as the first part of his address, and followed this up with a discussion of 205 cases occurring in his own private practice, of which he had complete records. The paper was rather longer than usual, but interest was maintained, due to the large number of cases reported coming under the Doctor's personal attention.

Dr. A. S. Cowie, a graduate of Dalhousie (1933), L.M.C.C., 1933, has commenced practice at Salisbury, N.B., succeeding Dr. H. L. Logan, who is now on the staff of the medical school inspection.

On February 19th the second of a series of exchange lectures was arranged by the New Brunswick Medical Association, Drs. D. W. F. Porter and R. A. Hughes appearing before the Woodstock Medical Society. Dr. Hughes spoke on the subject of "Mastoiditis, its incidence, diagnosis and treatment", and Dr. Porter's address was concerned with "Vomiting in infancy". Due to winter conditions the attendance was small, but much interest was shown in the addresses of the visiting speakers.

Dr. M. H. McKinnon, recently an intern at the Saint John General Hospital, has commenced practice at Debec, N.B.

A. S. KIRKLAND

Nova Scotia

Professor Fraser, of the Department of Biology, Mount Allison, recently delivered the address before the Students' Medical Society of Dalhousie University. His subject treated of the development in medicine in the past thirty-five years, and he was bold enough to forecast the likely developments for the next thirty-five years. Professor Fraser is well qualified to speak on such a subject since he has had a medical training as well as an extensive experience in the Biological Sciences.

Dr. Daniel MacDonald, of Sydney, presided at a meeting of the Cape Breton Medical Society to discuss plans for the annual convention of the Provincial Medical Society which is scheduled to meet in Sydney in July. Various committees were named to make arrangements for the meeting. It is proposed to invite some of the leading Canadian medical practitioners as guests of honour.

Dr. E. K. Maclellan, of Halifax, has been elected a member of the College of Obstetricians and Gynæcologists of Great Britain.

N. B. DREYER

Ontario

The Osler Day at Hamilton

On February 27th the Hamilton Academy of Medicine inaugurated most successfully an "Osler Day", which it is intended to make an annual function. The program included clinics and demonstrations, more than fifty items, arranged in groups to serve all interests, at the General Hospital in the morning and at the Mountain Sanatorium in the afternoon; a public luncheon at the Royal Connaught Hotel; a pilgrimage to the scenes of Osler's youthful activities at Dundas; and an informal dinner at McMaster University in the evening.

The luncheon was largely attended by the public-spirited citizens of Hamilton, and the chairman made eloquent use of the opportunity to plead with them to take a more personal interest in their civic institution, the General Hospital, which in its own sphere is as deserving of their pride as is the more spectacular sanatorium, which owes its growth and efficiency to their private and professional initiative. The guest speaker was Dr. T. B. Futcher, of Baltimore, whose admirable address on "The importance of bed-side study and teaching" is printed in this issue. A Toronto graduate, and on Osler's staff almost throughout his Baltimore period, no one is more competent than Dr. Futcher to deal with this, the contribution to medical education in which Osler took his greatest pride—witness the apt quotation from him printed on the place-cards, "I desire no other epitaph than the statement that I taught medical students in the wards." A microscope which belonged to his famous schoolmaster at Weston, the Rev. W. A. Johnson (one of the men and one of the instruments that gave Osler his start), was presented to the Hamilton Academy from Dr. N. B. Gwyn, Osler's nephew, who, unfortunately, was unable to be present, and who had obtained it, with another microscope now in the Toronto Academy, from Johnson's son, the late Dr. A. Jukes Johnson. The profession at Hamilton is versatile, the orchestra which regaled us with excellent music during the luncheon being composed entirely of local physicians!

The "Pilgrimage" was a delightful feature, particularly for Osler's old pupils who had come from afar. The famous beauty-spot, the Dundas Valley, may not look its best under ice and snow, but the date was chosen to commemorate Osler's first paper, "Christmas and the microscope", which appeared in the scientific monthly of the day. It was headed by a wintry quotation which drew a smile from the septuagenarian Osler, fifty years later, "The long vacation from Weston and Toronto were periods of profitable study with a borrowed microscope and books from Mr. Johnson and Dr. Bovell . . . My first appearance in print was in connection with the finding of diatoms, &c., in a frozen spring on the road between Dundas and Hamilton; and it is amusing to note, even at the outset of my ink-pot career, a fondness for quotations, this one from Horace, in those days a familiar friend." Having just seen one of the borrowed microscopes, the visitors were taken first to Binkley's spring, marked in Osler's day by a sunken barrel and now by a stone horse-trough. We were then shown the fine cairn erected in 1927 by the Hamilton Academy to Osler's memory, near the path by which he used to descend to the marsh for material; and the old rectory where he spent his boyhood; and were hospitably entertained by Dr. and Mrs. Bertram in the house where Osler first practised for a few weeks in 1874; and by Mr. and Mrs. F. I. Ker at

"Staplehurst", formerly owned by the famous lawyer, "B.B.", and by other members of the Osler family.

At the dinner the chief of many speakers was Dr. C. P. Howard, of Montreal, who happily suggested the planning of similar Osler pilgrimages to Toronto, Montreal, Philadephia, Baltimore and even Oxford. Short speeches were also made by other old pupils and assistants of Osler, namely, Drs. Camac of New York, Parsons of Toronto, Parfitt of Gravenhurst, Dr. Maude Abbott, of Montreal, Dr. Williams, of Rochester, N.Y., and by our Hamilton hosts.

The Canadian Medical Association, through Drs. Howard and Mullin, chairman and local member of its Osler Memorial Committee, cooperated with the Hamilton Academy in organizing this most successful Osler Day.

W. W. FRANCIS

On Monday, March 4th, Dr. James Ewing, Professor of Pathology, Cornell University, New York City, lectured at Convocation Hall, University of Toronto, on the subject, "The present day conception of cancer".

On March 4th, under the auspices of the Department of University Extension of the University of Toronto and the Canadian National Committee for Mental Hygiene, Mr. Carleton W. Washburne, Superintendent of Schools, Winnetka, Illinois, gave an address on "Mental health and education—reorganizing the school in the light of mental hygiene", in Convocation Hall.

Miss Elsie M. Lawler, formerly assistant lady superintendent of the Toronto General Hospital, and for the past twenty-five years principal of the school of nursing and superintendent of nurses at Johns Hopkins Hospital, Baltimore, has been granted an honorary degree of Master of Arts by the Johns Hopkins University. Miss Lawler was born in Whitby, Ont.

The Toronto Board of Health has upheld the Medical Officer of Health in declining to give approval to the proposal that the privately supported birth-control clinic on Dundonald Street, Toronto, be placed under the control of the Out-patients' Department of the Women's College Hospital.

A number of changes have recently been made in the staffs of the Ontario Hospitals. Dr. Jos. S. Stewart, Superintendent of the Ontario Hospital, Toronto, has been appointed head of the Ontario Hospital at Hamilton, taking the place of Dr. J. J. Williams, who has been superannuated. Dr. R. C. Montgomery, at present senior assistant at the Ontario Hospital, Whitby, will be superintendent at the Ontario Hospital, Toronto. J. H. ELLIOTT

The Medical Faculty of Queen's University will present a short post-graduate course, commencing Monday, September 16th, and continuing for that week. Clinical and pathological demonstrations will be arranged for, mornings and afternoons. If interested please get in touch with Dr. L. J. Austin, Queen's University, Kingston, Ont., for details.

Quebec

A gift of $200,000 to the Royal Victoria Hospital, Montreal, from Sir Herbert Holt, President of the Board of Governors, was announced at the 41st annual meeting of this hospital on February 21st. The gift is to be known as "The Herbert S. Holt Foundation". The appointment of E. W. Beatty, K.C., as Vice-president of the Board was also made known. In the absence of the president, Mr. Beatty presided and reviewed the report of activities of the hospital for the previous year.

Appointments made to the medical staff were announced as follows, in the department of medicine: Dr. S. Graham Ross, pædiatrician-in-change; Dr. H. P. Wright, pædiatrician; Dr. Jessie Boyd Scriver, associate in pædiatrics; Dr. Lemuel P. Ereaux as assistant dermatologist; Dr. J. Wendell MacLeod, and Dr. Dorothea Mellor, clinical assistants in medicine; Dr. H. L. Bacal and Dr. S. I. Doubilet, clinical assistants in the sub-department of pædiatrics; Dr. Frank E. Cormia, sub-department of dermatology; Dr. N. Milton Gray, clinical assistant, sub-department of psychiatry; Kenneth Evelyn, research assistant in the university clinic.

Department of surgery: Dr. A. L. Wilkie, Dr. John Armour, and Dr. G. Gavin Miller associates in surgery to be assistant surgeons; Dr. Edgar M. Cooper, clinical assistant to be associate in surgery.

Department of obstetrics and gynæcology: Dr. A. D. Campbell, obstetrician and gynæcologist; Dr. J. S. Henry, associate in obstetrics and gynæcology.

Department of urology: Dr. V. J. Berry, clinical assistant in urology.

Department of roentgenology: Dr. E. C. Brooks, acting roentgenologist-in-chief.

The following members of the active attending medical staff tendered their resignations and were appointed to the consulting staff: Dr. H. B. Cushing, physician; Dr. A. G. McAuley, assistant ophthalmologist; Dr. A. H. Pirie, roentgenologist-in-chief.

Regret was expressed at the resignation of Dr. H. B. Cushing, who retired after a period of 34 years as an active member of the attending staff. In accepting the resignation of Dr. A. H. Pirie the Board of Governors recorded its deep sense of appreciation for his service to the hospital as director of the department of roentgenology since November, 1911, and announced that Dr. Pirie would be appointed consultant to the department of roentgenology to direct the radio-therapeutics.

During the year under review 13,307 patients, an increase of 300 over the previous year, were admitted to the hospital. Of there, 4,435 were private or semi-private patients, the balance either being public pay, indigent or free patients.

The death rate was reduced, from 2.4 per cent in 1933, to 2.2 per cent. These figures did not include still births or patients who died within 48 hours of admittance. It is noteworthy that the maternity department of the hospital, with a total of 2,462 confinements, with 500 of the patients at their homes, registered a record low maternal mortality rate of 0.25 per cent.

Dr. Edward Archibald, Chief of the Surgical Service of the Royal Victoria Hospital, Montreal, and Professor of Surgery at McGill University, has returned from Melbourne, Australia. The Honorary Fellowship of the Royal Australasian College of Surgeons was conferred on him on March 5th.

General

Report of the Secretary to the Trustees of the Banting Research Foundation, December 19, 1934

The work carried out under grants from the Foundation during the past year has been very satisfactory. Further, during the year reports and printed papers have been received from workers whose grants terminated during the year 1932-33. As a result, the Secretary is able to report that 20 papers have been published during the past year, and several are in preparation or have been submitted for publication. The number of printed papers would have been increased had not the depression led editors of scientific journals to refuse three or four papers on account of their length, or the necessity for a larger number of illustrations than their funds allowed them to accept.

This difficulty has shown itself most acutely in regard to the grants made for the study of the racial factor in labour, by Dr. Cates, representing the Committee in charge, and Dr. Goodwin. One paper in this series has now been accepted, and there is hope that others will also appear during the next year.

Papers published during the year include that of Dr. A. C. Abbott (Manitoba), whose paper on constriction of the trachea confirms and extends the work of Breitner and others on the effect of oxygen restriction on the thyroid gland; that of Prof. J. Beattie and P. R. Macdonald (McGill), which forms an important contribution to the physiology of the lachrymal gland; of Dr. Maurice Brodie (McGill), whose seven papers on infantile paralysis led up to his work on treatment, which is attracting widespread interest; Dr. A. M. Davidson (Manitoba), in five communications on fungus diseases of the skin, contributed much to our knowledge of these diseases, their animal hosts and their treatment. Dr. R. D. H. Heard, with Dr. A. D. Welch (Toronto), showed that ascorbic acid was the substance which prevented the oxidation of epinephrine in adrenal perfusates. This work also opened up a field of study in the oxidation reduction changes in the body which had not been previously explored. Dr. R. F. Shaner (Alberta), published two interesting studies of the embryological development of the eighth nerve nuclei. Miss Armine Alley (McGill), published three papers dealing with the mechanism of gastric secretion and with the treatment of hyperacidity.

The grant made annually under the second clause of the Foundation's charter to Sir Frederick Banting for the working of the Department of Medical Research (Toronto), was also productive of much valuable work and some thirteen papers. Several of these dealt with the biochemistry of silica in the body, others with the phospholipids and glycerophosphates, their enzymic hydrolysis, and the type of phosphoric esters in malignant tissues. To these studies Drs. E. J. King, M. E. Dolan, H. Stantial, A. R. Armstrong, J. J. Rae, J. Fallon, D. A. Irwin and E. L. Outhouse contributed, while H. J. Perkin contributed a paper on the determination of iodine in the blood.

Annual Meetings.—The Canadian Public Health Association, the Canadian Tuberculosis Association, the Canadian Social Hygiene Council and the Ontario Health Officers' Association are holding their Annual Meetings together this year on June 3rd, 4th and 5th at the Royal York Hotel, Toronto.

Three joint sessions are being arranged. Among the visiting speakers expected are Surgeon-General Cumming, of the United States Public Health Service; Dr. E. L. Bishop, Commissioner of Health for the State of Tennessee and President of the American Public Health Association; Dr. C. L. Scamman, Director of the Division of Public Health of the Commonwealth Fund; and Dr. John A. Ferrell, of the International Health Division of the Rockefeller Foundation.

Nine Section meetings of the Canadian Public Health Association: Each of the following Sections of the Canadian Public Health Association will provide one or more of the morning sessions: Public Health Engineering, Laboratory, Epidemiology and Vital Statistics, Public Health Nursing, Industrial Hygiene, Mental and Social Hygiene.

Three special sessions of the Ontario Health Officers' Association will be held, including a series of demonstrations and the annual round-table dinner conference.

Clinical and formal sessions of the Canadian Tuberculosis Association are being planned for each morning.

Annual Meeting of the Canadian Social Hygiene Council.

An outstanding feature of the conference will be the extensive scientific and commercial exhibits. Plans are being made to present to health officers practical suggestions for a program of health education suitable for rural and small urban muncipalities. The exhibits will be under the joint auspices of the four associations.

The International Hospital Congress in Rome.—Arrangements have been completed for the fourth Congress of the International Hospital Association to be held in Rome from May 19th to 26th this year. The Italian government has extended a most cordial welcome to the Association, and it is anticipated that the Congress will be opened by the Head of the Italian Government in the Capitol.

Among the subjects to be discussed will be "The hospital as a link of a systematic public health service", "Equipment and technical appliances in hospitals", and "The hospital in case of a national calamity". Papers will be given on eugenics, the use of electrotherapy, the safeguarding of hospitals against aerial attacks, the medical and nursing staffs, etc. Previous to the Rome sessions a study and sight-seeing tour is being arranged, starting at Milan on May 12th and visiting Turin, Genoa and Florence. A large attendance is anticipated, as the dates coincide with the height of the tourist season in Italy.

The headquarters in Rome will be the Hotel Russia, Via Borghese.

Dr. Elmer I. McKesson, known internationally as the inventor of a machine for administering anæsthetics, died on February 22nd, aged fifty-three.

Book Reviews

Body Mechanics. J. E. Goldthwait, M.D., LL.D., Member of Board of Consultants, Massachusetts General Hospital, and others. 281 pages. Price $4.50. J. B. Lippincott, Philadelphia, London and Montreal, 1934.

This book is the result of many years of study by a group of men who have had singular experience in the treatment of chronic disease. It might be entitled Medical Orthopædics — a phrase used by the authors. It begins with a strong plea for better instruction and for greater interest in chronic conditions. Anatomy and physiology, as generally taught, are concerned with a standard individual, whereas human beings are of varying types, each with his own disease tendencies, as has been taught by Draper, Montressori and many others. A constantly applied strain in supporting structures of the viscera results in damage comparable to that seen in joints. The chief cause of such strain is in postural habits called, by the authors, "body mechanics". The diaphragm is considered as a muscle second only in importance to the heart. Postural impairment in the diaphragm results in visceral congestions, due to its failure to properly assist return flow through the vena cava. General body-sag affects the splanchnic ganglia, and may cause direct pressure upon fixed organs such as the pancreas and duodenum by tense mesenteric vessels. Chronic congestion resulting from poorly assisted venous return and by drag upon the cœliac axis results in time in many functional disorders which might have been prevented, and, in many cases, may be cured by proper correction of body mechanics. Re-education of the diaphragm brings relief to a strained heart, and, by improving venous circulation, may effect relief in pelvic disorders and varicosities.

The methods by which these results are to be obtained are stated as principles and not as dogmas. The authors expect that the exercises and appliances

used by them will be modified by individual practitioners to suit the case in hand. A few illustrative case-histories give convincing proof of the value of the application of these principles. "The patient must be treated as a whole, the time having passed when the baking of joint for arthritis, or the electric stimulation of nerve cells for the progressive paralyses should represent the best we can do for our patients."

The Science and Practice of Surgery. W. H. C. Romanis, M.A., M.B., M.Ch.(Cantab.), F.R.C.S.(Eng.), F.R.S.(Edin.) and Phillip H. Mitchiner, M.D., M.S.(Lond.), F.R.C.S.(Eng.) Fifth edition. Vol. I, General Surgery, 788 pages. Vol. II, Regional Surgery, 962 pages. Price $13.00 (2 vols.). Lea & Febiger, Philadelphia, 1934.

It is tribute to any text-book to note that it has reached five editions within seven years. Two years ago the fourth edition was favourably reviewed in the *Journal*. The fifth merits a commendation at least equal to that given its predecessor. The chapter on anæsthetics has been re-edited and the article on otolaryngology again revised.

It would be difficult to find a work that would better serve the purpose for which it was designed. It is written for students and general practitioners. It should also be of great service to clinical teachers in surgery. The synopses of surgical anatomy are perfect examples of succinct statement.

The whole field of general surgery is covered in a total of 1,751 pages, which implies severe condensation. The resulting compactness has not been attained by any sacrifice of clarity. When a choice is made of one method of treatment other standard procedures are fairly presented.

The section on fractures would bear some further revision. Plaster of Paris has not come into its own, although its application is advocated in certain conditions, and the concession is made that it should find a wider usefulness.

The type used is small, so that each page carries about six hundred words, but the printing is clear and easy to read. The illustrations are very good in quality and abundant. One very convenient feature is the inclusion in each volume of the complete index of the whole work.

Textbook of Urology. Daniel N. Eisendrath, M.D., Consulting Urologist, American Hospital, Paris, France, and Harry C. Rolnick, M.D., Clinical Professor of Genito-urinary Diseases, Loyola University Medical School. Third edition revised; 942 pages, illustrated. Price $11.00. J. B. Lippincott, Philadephia, London and Montreal, 1934.

The first edition of this admirable text-book of urology was published in 1928. The early appearance of a third edition indicates its favourable reception by the medical reading public, and confirms the approving comment expressed in our review of the first edition. The book has the same attractive appearance and is almost identical in contents with the first edition. The authors have, however, made use of the opportunity to add a small amount of new material, dealing with the subjects of intravenous urography, the differentiation of biliary and renal calculi, and the still much disputed subject of transurethral prostatic resection. The book has been maintained at 942 pages and 700 illustrations, in spite of the new reading matter, by slight alterations in the illustrations, without in any way impairing its value. The reviewer regrets to note that care has not been taken to make all the necessary changes in the index required by the new pagination.

We can heartily recommend this as a text-book in urology. It is an adequate, clear and comprehensive presentation of the subject, equally satisfactory for student use and as a book of reference. In our opinion, it is one of the very best text-books on urology published in the English language.

Electrocardiography. Chauncey C. Maher, B.S., M.D., Assistant Prof. of Medicine, Northwestern University. 250 pages, illustrated. Price $4.00. William Wood, Baltimore, 1934.

Some excellent monographs on electrocardiography have been written in the past few years. This recent addition by C. C. Maher should be, however, a very useful and practical volume. It has been written with the view of giving to the student and busy practitioner a working knowledge of this somewhat technical but important field. The book is concise, but with sufficient explanation not to be vague, and leaves out controversial points and theoretical discussions, which might tend to be confusing and interest only the limited group of cardiologists. The illustrations are excellent and well arranged with clear-cut explanatory diagrams. The electrocardiograms, illustrating all types of cardiac conditions, are supplemented by a clinical diagnosis divided into four parts—etiological, anatomical, physiological and functional, followed by the interpretation of the tracing, with a summary and clinical conclusions. This gives the monograph a style of its own, making it a valuable addition to the shelves of anyone anxious to learn the fundamentals of electrocardiography.

A Pathology of the Eye. Eugene Wolff, M.B., B.S., F.R.C.S., Ophthalmic Surgeon, Royal Northern Hospital. 283 pages, illustrated. Price 28s. net. H. K. Lewis, London, 1934.

This work is the production of an anatomist and pathologist who also ranks high as an ophthalmologist. It is based upon lectures and demonstrations given during the last five years as Pathologist to the Royal Westminster Ophthalmic Hospital. As one would expect, therefore, the scientific and the clinical are usefully blended. There are eighteen chapters and the classification of ocular conditions is in the main regional; diseases of the orbit are dealt with, and there are also chapters on the optic nerve, strabismus, errors of refraction, glaucoma, congenital anomalies, eye changes in diabetes, and injuries to the eye. A striking feature of the book is the excellence of the illustrations, which are technically perfect. At the beginning of each chapter can be found a figure depicting the normal anatomy of the part of the eye under consideration. There is a useful bibliography.

Any criticism that is offered here can only deal with minor points and is intended to be constructive. It does not seriously detract from the value of the book. The book gives an impression of "scrappiness". It is, however, intended by the author only as an "introduction" to a subject whose essentials most students and ophthalmic surgeons find it difficult to come by. This may account for it, in the main. In our judgment the impression would have been much mitigated if there had not been such lavish use of the paragraph. The continuity of topics is frequently broken in this way, without compensating advantage. With the change suggested, also, considerable space could be saved. It would have been more logical, we think, to have placed the last chapter, dealing with the general pathology of the eye, first. It is really introductory in character.

This is a work that should appear to the general practitioner, for he will find here all he needs to know about disease of the eye and its accessory structures. It will not be without value to the specialists. The book is well produced, is of a reasonable size, and offered at a reasonable price.

BOOKS RECEIVED

Summary of the Treatment of Fractures and Dislocations. R. Broomhead, M.B., F.R.C.S., Surgeon, Orthopædic Department, General Infirmary at Leeds. 39 pages. Price 3/6 net. Jowett & Sowry, Ltd., Leeds, 1935.

Biological Politics. F. William Inman, M.B., Ch.B. 258 pages. Price $2.25. John Wright & Sons, Bristol; Macmillan Co., Toronto, 1935.